

A SYSTEMATIC
REGIONAL GEOGRAPHY
A Post-Matriculation Course

VOLUME II
EUROPE

J. F. UNSTEAD, M.A., D.Sc.

*Formerly Professor of Geography in the
University of London*

*With Numerous Maps and
Diagrams Specially Prepared
and other Illustrations*

UNIVERSITY OF LONDON PRESS LTD.
WARWICK SQUARE, LONDON, E.C.4

FIRST PRINTED 1939
SECOND EDITION 1953

PREFACE TO SECOND EDITION

THIS edition has been thoroughly revised to take account of the changes due to the Second World War and the first five years of reconstruction which followed. Part I, dealing with the continent as a whole, and Part II, describing the geographical regions, have been corrected and brought up to date. Part III, dealing with the individual States and the political aspects of geography, has been re-planned, re-written and considerably enlarged, with new maps and illustrations.

In this section it is not only facts about boundaries and extent of States, their populations and the nature of their commerce, etc., which have suffered change as a result of the war ; in many cases the States have taken over large powers of directing economic activities, and thus become geographical factors of the first importance. Over large parts of Europe, agricultural, industrial and commercial geography is now largely determined by the ideas and actions of governments. This new situation is more fully set out in the Introductory Note to Part III on pp. 290-1.

Yet the study of the States, as here dealt with, is by no means limited to this aspect. In each case I have tried, as far as space would allow, to show how the origin and development of its people are related to the situation and nature of the territory.

October, 1952.

EXTRACT FROM PREFACE TO FIRST EDITION

THIS study of the lands and peoples of Europe is written primarily for the use of students taking "Intermediate" or "General" courses towards a University degree, "Higher School" examinations, or courses in Training Colleges.

It aims at providing a twofold training: in the first place it not only presents facts but points out their significance and how they may be correlated; in the second place it shows the interaction between the facts of geography and those human affairs, economic and political, which concern all citizens.

Yet a study of Europe involves considerable difficulties, for it confronts one with a mosaic of geographical units, a jig-saw puzzle of nationalities and a kaleidoscopic picture of States ; one must have a method of recognizing order and causation in this complexity, for these three factors overlap and conflict in a most confusing manner. For instance, in many cases the natural unit of the geographer, e.g. the Rhine Rift Valley or the Alpine Highland, is inhabited by people of more than one nationality and divided among two or more States. Because the various States bear so little relationship to geographical regions, and also are liable to sudden and catastrophic changes, it seems to the writer impracticable to arrange a study of Europe according to the political divisions ; hence this book has three parts.

Part I makes a general survey of the continent as a whole—its relief and structure, its climates, soils and vegetation, the types of land-utilization and production and, by combining these factors, the major geographical regions ; at this stage, also, a general survey of the peoples and States of Europe is given. The broad pattern of the distribution of the physical and human elements is thus brought out.

Part II presents a more detailed study on the basis of the natural or geographical regions which comprise the continent : the major and minor regions and, except in eastern Europe, the sub-regions. These are treated as units, and in each the interrelations of the physical and human factors are considered, characteristic types of scenery are described and economic conditions are given special attention.

In Part III each of the States is dealt with in turn. Their physical and economic foundations are reviewed, the peoples who form their populations are considered, and an examination is made of the boundary changes of recent years and of those national and international problems which are either influenced by geographical factors or have geographical effects. In this section, facts are stated without prejudice, causes and consequences are pointed out, but judgments are deliberately withheld as unsuitable to a geographical text-book.

CONTENTS

PART I

EUROPE AS A WHOLE

CHAPTER	PAGE
I. RELIEF AND STRUCTURE	1
II. CLIMATE	21
III. VEGETATION, SOILS AND LAND-UTILIZATION	44
IV. GEOGRAPHICAL REGIONS	63
V. THE PEOPLES	76

PART II

THE REGIONS

VI. THE NORTH SEA LOWLANDS	96
VII. THE SOUTH-WEST BALTIC LOWLANDS	116
VIII. NORTHERN FRANCE	126
IX. SOUTHERN AND CENTRAL FRANCE	139
X. THE CENTRAL EUROPEAN UPLANDS	155
XI. THE ALPINE LANDS	182
XII. THE DANUBIAN LANDS	197
XIII. THE BALKAN PENINSULA	212
XIV. THE ITALIAN PENINSULA	226
XV. THE IBERIAN PENINSULA	239
XVI. THE SCANDINAVIAN PENINSULA	257
XVII. EASTERN EUROPE	270

PART III

THE STATES

	PAGE
TABLE OF REFERENCE TO STATES . . .	289
INTRODUCTORY NOTE	290
CHAPTER	
XVIII. MARITIME MARGINS	292
(A) NORTHERN EUROPE	
XIX. MARITIME MARGINS	300
(B) WESTERN EUROPE	
XX. MARITIME MARGINS	314
(C) SOUTHERN EUROPE	
XXI. EASTERN (TRUNK) EUROPE	335
XXII. EAST CENTRAL (TRANSITIONAL) EUROPE	353
XXIII. WEST CENTRAL EUROPE	377
INTER-STATE ORGANIZATIONS	390

Note.—For the names of the individual States, see the Table of Reference to States, page 289.

APPENDIX

I. TIME SEQUENCE OF GEOLOGICAL PERIODS AND EARTH-MOVEMENTS	393
II. LIST OF BOOKS	394
INDEX TO GEOGRAPHICAL NAMES	396

LIST OF ILLUSTRATIONS

Regions and Political States of Central Europe

Front End-paper

Population Map of Europe *Opposite Page 1*

FIG.	PAGE
1. Structural Regions of Europe	4
2. Sections showing Relief of Scandinavia	6
3. Distribution of Glaciation and Loess	8
4. Section through the Saxon Uplands	11
5. Sections showing the Structure of the Alps	15
6. Principal Mineral Workings of Europe	19
7. January "Low" Tracks, Winds and Isotherms	22
8. July "Low" Tracks, Winds and Isotherms	23
9. Temperature and Rainfall Graphs of Climatic Types	27
10. Duration of Frost Period	30
11. Duration of Warm Period	31
12. Mean January Precipitation	32
13. Mean July Precipitation	33
14. Mean Annual Precipitation	36
15. Climate Regions of Europe	38
16. Natural Vegetation Regions of Europe	46
17. Soil Regions of Europe	53
18. Land-use Regions of Europe	56
19. Geographical Regions of Europe	66
20. Railway Routes and Commercial Centres	69
21. Regional Types of Temperate Europe	72
22. Distribution of Predominating Racial Types	77
23. Racial Migrations into Europe	80
24. Distribution of Languages before Second World War	84
25. Distribution of Religions	89
26. State Boundaries before and after First World War	92
27. Section through North Sea Lowlands	97
28. View near Haarlem	100
29. Waterways leading to North Sea Lowlands	102

FIG.	PAGE
30. Regions of the North Sea Lowlands	108-9
31. View in Ghent	110
32. Coalfields of the North Sea Lowlands	113
33. Regions of the South-west Baltic Lowlands	118
34. View on the Island of Fünen	120
35. Regions of Central France	128
36. Structure of Central France	129
37. View in Paris	130
38. Section through Northern France	132
39. Regions and Structural Trends of France	140
40. View at Le Puy	143
41. View on the River Tarn	147
42. Regions of Central Uplands of Europe	155
43. Regions of the Rhine Uplands	156
44. Structure of the Rhine Uplands	157
45. View on the River Mosel	159
46. Regions of the Rhine Rift-valley	162
47. Section through the Rhine Rift-valley	163
48. Section through the Rhine Scarp-lands	165
49. Regions of the Bohemian Massif	172
50. Structure of the Bohemian Massif	173
51. View in Praha	174
52. Section through the Jura Uplands	176
53. Regions of Alpine and Neighbouring Lands	188-9
54. View of the Mer de Glace	190
55. View of an Alpine Pasture	192
56. Regions of the Danubian Lands	198
57. View of a Carpathian Pasture	200
58. Structure of Southern Europe	204
59. Regions of the Balkan Peninsula	214
60. View on the Karst Plateaus	218
61. View on the River Bosna	219
62. View on the North Italian Plain	228
63. Regions of the Italian Lands	231
64. Regions of the Iberian Peninsula	240
65. Vegetation and Irrigation in the Iberian Peninsula	243
66. View of the Cirque of Gavarnie	246
67. View in Elche	254

LIST OF ILLUSTRATIONS

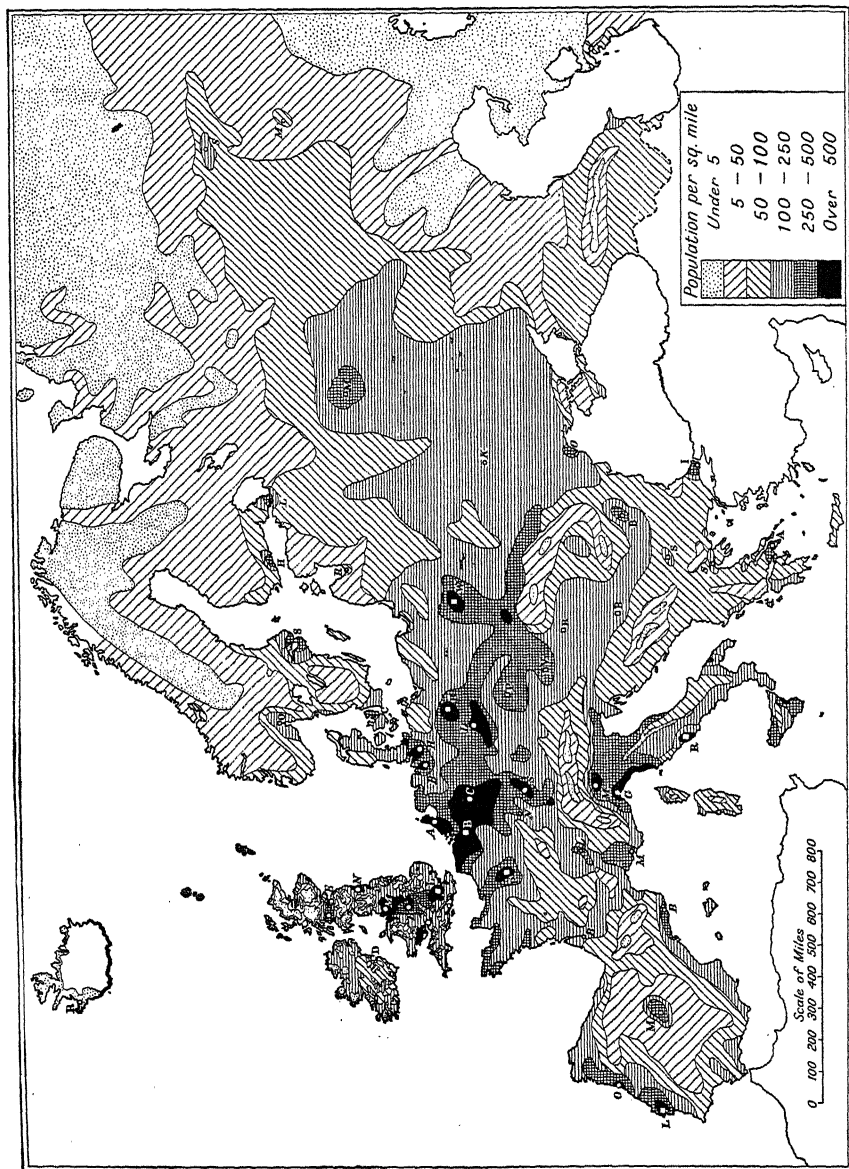
xi

FIG.	PAGE
68. Regions of the Scandinavian Peninsula	258
69. View on the Stor Fiord	260
70. View of Ironworks by the River Dal	265
71. Regions of Eastern Europe	272
72. View on Lake Paijanne, Finland	274
73. View in Magnitogorsk	277
74. View of the Dam at Dnieprostroy	285
75. View in Stockholm	295
76. Border-lands of Belgium, France and Germany	307
77. View of a Civic " Lay-out " in Paris	313
78. View in Athens	329
79. Territories of the U.S.S.R.	332-3
80. Industrial Areas and Centres of the U.S.S.R. in Europe	348-9
81. State Boundaries before and after Second World War	355
82. Industrial Centres in East-Central Europe	364-5
83. Constituent Republics of Yugoslavia	371
84. View of a Swiss Electricity Installation	379

Languages and Political States of Central Europe

Back End-paper

Note.—The maps in the above list have been specially drawn to illustrate the text. They deal with all aspects of the geography, but they are intended only to supplement the maps to be found in atlases ; it is assumed that an atlas will be constantly used with this book.



PART I

EUROPE AS A WHOLE

CHAPTER I

RELIEF AND STRUCTURE

Introduction.—If we want to understand the nature of any region and the manner of life of its people, and we trace back to the reasons for the facts, we find that the most fundamental consideration is the position of the region in the world—its situation on the globe.

That position has, in the past, determined the way in which the region has shared in the great earth movements which have, for example, raised some areas to broad highlands, subjected some to foldings producing mountain systems, or lowered others, in some cases even below sea-level; in other words, the position has determined the broad features of the relief and structure of the region.

The main characteristics of the climate are similarly due to its position on the globe, which exposes the area to the influence of the sun and to that of one or more great wind-systems, while the relief also influences the climatic conditions.

Climate and relief together are directly or indirectly the chief factors conditioning the type of vegetation which can live in the region, and this in turn has a great influence on the agricultural and pastoral work by which many of the people get their living.

Of course, the environment of a people does not *determine* their work, nor their particular manner of life, for different peoples are at different stages of development and have different traditions and habits. Yet the position of a region in relation to other regions, either near at hand or far away, has been one of the main factors in aiding the immigration of peoples and ideas, and so affecting the character of the population and their mode of life. Moreover, the incentives and opportunities which their environment may offer influence their further development.

The position of regions may therefore be regarded from several points of view, and in each of the earlier chapters of this book, which deal with the general characteristics of Europe and its peoples, we shall examine the position of the continent from the particular aspect with which we are concerned. Accordingly, we will now consider how the varied relief and structure of the continent are related to the situation of its constituent regions.

A relief map of Europe shows at once a marked contrast between the relatively level and unbroken east, and the remaining part of the continent which is diversified by many uplands and lowlands and, moreover, is divided by invasions of the Atlantic waters and by inland seas. This fundamental distinction as to relief and outline affects practically all aspects of the physical and human geography of the two contrasted regions, known sometimes as "Trunk Europe" (because it forms part of the great trunk of the Euro-Asiatic land-mass) and "Peninsular Europe" respectively. The cause of the contrast lies in the fact that whereas eastern Europe is situated in a part of the globe which has been relatively stable through much of its geological history, the rest of the continent has been involved in repeated disturbances and dislocations of the crust of the earth.

In Peninsular Europe, on the north-west margin of the continent, one group of highlands stands out clearly and will be first considered.

The North-western Highlands.—The Highlands of Scotland and the north of Ireland resemble in many ways, though on a smaller scale, the Highlands of Scandinavia because they have shared the same geological history.

Some of the rocks comprising these regions were formed before the Palæozoic Era, i.e. before any life appeared upon the earth; even at that time the surface was contorted, and these earliest rocks were folded into great mountain ranges, but of these denudation has by now removed all but the deepest roots.¹

During the Palæozoic Era other rocks were formed, and in the Devonian Period there occurred a series of dislocations of the earth's crust which were called the "Caledonian" earth-movements because their effects were studied in the structure of Scotland. At this period the rocks were subjected to great

¹ A time-sequence of the geological periods and the great earth-movements is given in Appendix I.

foldings in a general south-west to north-east direction. As a result the Caledonian mountain system arose, which extended over all the region now forming the north-western margins of Europe (see Fig. 1), including Spitsbergen far to the north of Scandinavia. In the course of these disturbances much of the rock was metamorphosed into crystalline forms, including schists and gneisses, while there are also large areas of granite, gabbro and other resistant igneous rocks.

From this period onward through the Secondary Era the great mountain system was worn down to the condition of a peneplain, and only its stumps remained. Then, in the "Alpine" earth-movements of the Tertiary Era, the region again suffered disturbance, this time by faulting and the uplift of some of the resultant dislocated blocks and the subsidence of others. At this time, too, that part of the earth's surface now under the Atlantic waters was detached from the continental platform from which the lands of Europe rise, and the present shape of this margin of Europe was determined.

On the continental side, the blocks were raised probably in more than one stage, so that a low terrace-like step was formed between the sea and the great plateaus which in the Dovre Fjeld now reach over 7,500 feet and in the Jotun Fjeld over 8,000 feet (see Fig. 2). Moreover, the area was dislocated by faults running in several directions, and along these cracks there occurred both subsidences and also lines of weakness along which rivers eroded deep valleys in the plateaus.

Through such cracks and vents in the earth's crust, the pressures associated with the Alpine disturbances forced volcanic material in a number of places, and the Farøe Islands and Iceland in the far north-west are almost entirely formed of these volcanic accumulations.

In the Ice Age, snow accumulated on the high plateaus and ice was formed which worked its way down the valleys, deepening them and changing their section from V-shape to U-shape. In many other ways, too, glaciation played a part in producing the present relief; and its general importance is so great that we may at this point consider it further, although its influence extended far beyond the limits of the North-west Highlands.

At one stage the climate was so cold and precipitation was so great that the great ice-sheet from the Scandinavian Highlands and the smaller ones from the British Highlands extended south-

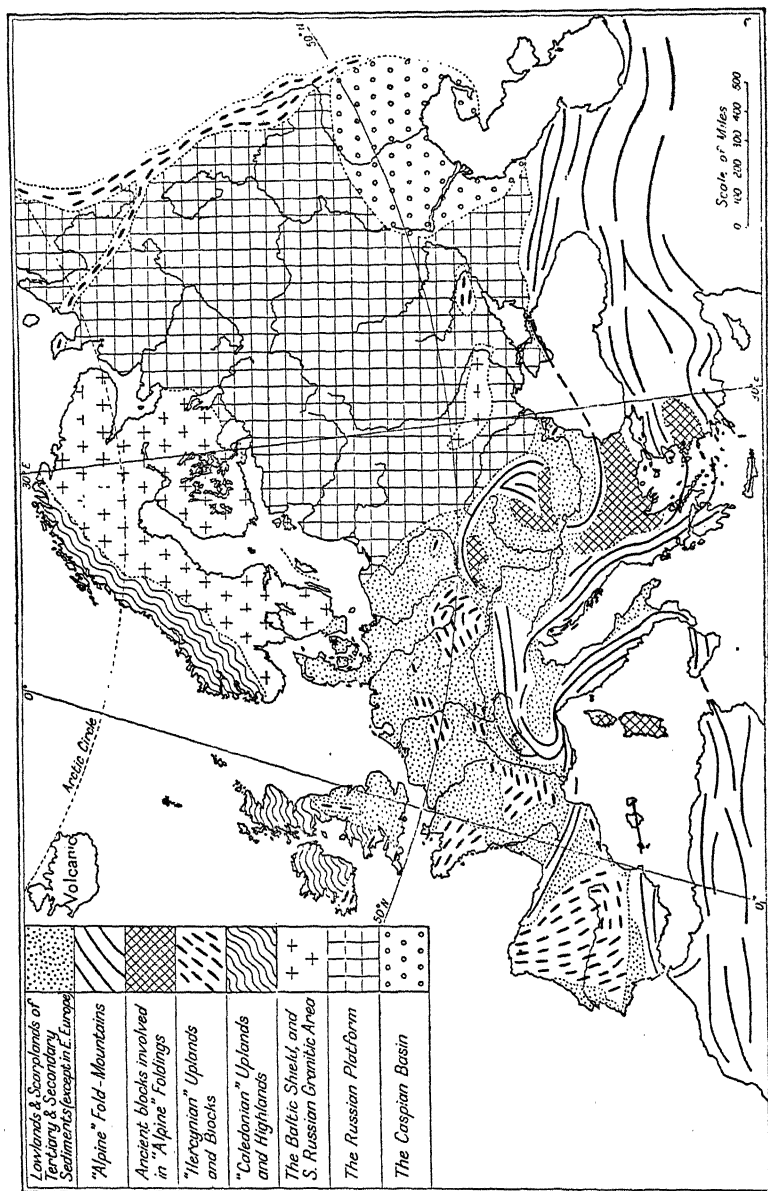


FIG. 1.—STRUCTURAL REGIONS OF EUROPE.
Note.—To aid comparison, the outlines of the regions are repeated in Fig. 6.

ward as far as the broken line marked as the maximum extension of the ice on the map showing the distribution of glaciation (Fig. 3). After this period, the climate became warmer, the southern part of the ice-sheet gradually melted and its edge lay progressively farther north; this continued until the climatic improvement ceased and the margin of the sheet remained in the same position. Here lines of terminal moraine, composed of boulders, gravels, sands and clays, marked the end of this stage in the retreat of the ice. In the area between the outer margin of the earlier ice-sheet and the terminal moraines, there was now visible a layer of boulder-clay, the ground moraine formed below the ice in its wider extension. Also, melted ice-water washed away clayey and sandy material from the later terminal moraines, and much of this was deposited upon parts of the ground moraine; occasionally such sheets of gravel and sand covered considerable areas. At later periods, with other climatic changes, the ice-edge withdrew farther, and the various stages in the retreat of the ice are therefore marked by alternations of lines of very irregular and often hilly terminal moraines, and flatter stretches of clayey or sandy character. Since the farthest southward advance of ice occurred, there has elapsed sufficient time for streams and weathering to reduce considerably, and to smooth out to some extent, the glacial deposits, but some of the later series remain so little affected that they dominate the landscape and largely control the way in which man uses the land.

An important effect of the ice was to obstruct or alter the courses of the streams, and in many parts this is now shown by rapids in the rivers and by the presence of lakes or swamps. Immature river-development and poor drainage are frequent characteristics of glaciated regions.

In general, the areas from which the ice worked its way outward are those in which its scouring action predominated, while the marginal areas of glaciation are those of deposition. Hence, over parts of the North-western Highlands region the soil was completely worn away and bare rock is the witness of the action of the ice, while in other parts are the coarse gravels and sands of the later terminal moraines. Taken as a whole, in the northern regions glaciation has made surface conditions more difficult for man's occupation and use; on the other hand, some of the glaciated regions of central and western Europe have

benefited by the finely ground and fertile material brought from the north.

Another very important element in the evolution of the Northwestern Highlands was a succession of changes in the relative level of land and sea which have occurred several times since the Alpine dislocations, and are still in progress. These changes

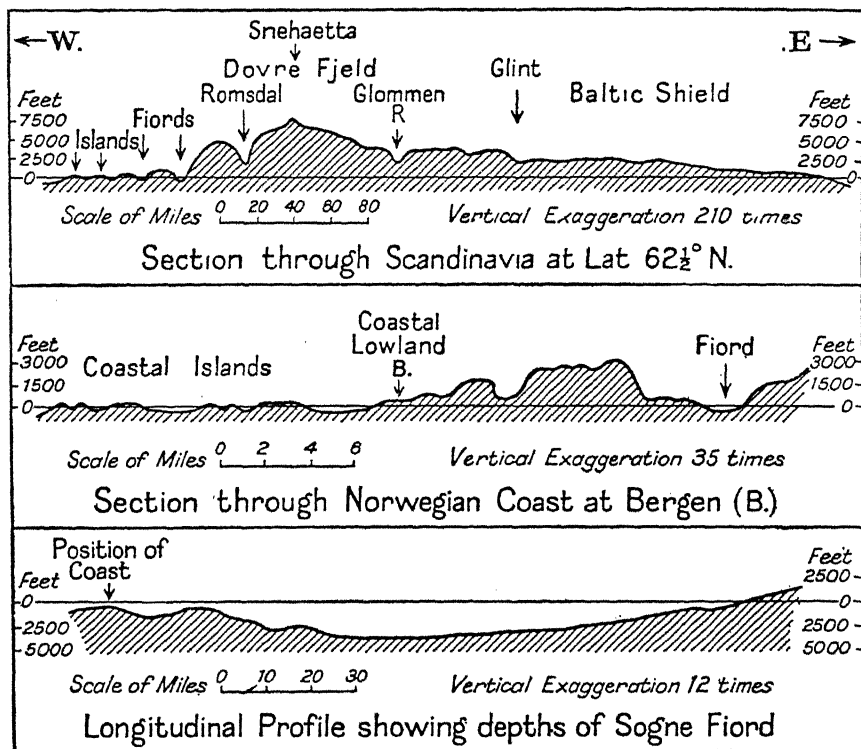


FIG. 2.—SECTIONS SHOWING RELIEF OF SCANDINAVIA.

may be due either to alterations in the level of the sea or to the slow risings, sinkings or tiltings of the land masses; in this part of the world the broad result has been a general sinking of the continental margin as compared with the Atlantic waters, and consequently the shores have been partially "drowned." The low terrace off the Norwegian coast has been reduced either to several small archipelagoes or to narrow patches of lowland extending beyond the highlands (see middle section in Fig. 2).

Also, the lower parts of the valleys, whether due to faulting, to stream erosion, to scraping and deepening by ice, or to a combination of these processes, have been invaded by sea-water and have become the wonderful fiords, with great side-branches leading inland, in some cases for scores of miles. Usually the fiords have steep or even vertical sides, rising to many hundreds of feet, while below the quiet waters are corresponding depths (see bottom section in Fig. 2). Apart from the narrow patches of coastal lowland the only habitable areas are either at the heads of the fiords or at the sides where old terraces interrupt the mountain slopes ; they give landing-places when they are at the water-level, and fields and pastures when they are a little above it.

The influence of this history and its resultant land-forms on human occupation will be considered in detail later. Yet it may be at once observed that it is in the main unfavourable, although the indented coast affords harbours for seafaring. Less obvious is the fact that the enormous amount of denudation has brought the surface of the earth down to the level of the minerals, originally formed in the depths, and now able to be reached by man ; iron and copper ores are therefore among the rather scanty resources of the Scandinavian Peninsula (see Fig. 6).

Another very important result of the geological history is the modification of climatic conditions by the upraised continental margin bordering the ocean. The precipitation of rain or snow is concentrated, as it were, along the coast and on the neighbouring mountains, while in the lee of the great barrier the Baltic lands are relatively dry. Similarly, the moderating influence of the oceanic winds is mainly limited to the Atlantic margins ; behind the highlands continental conditions at once begin, and from Sweden right across north-eastern Europe and far into northern Asia extend regions where the long, severe winters allow the growth only of the tundra or coniferous forest vegetation.

The Baltic Shield.—The Scandinavian Highlands descend, often by a marked drop, known as the Glint (see Fig. 2), to a great region which dips gently eastward under the Gulf of Bothnia and rises again in Finland, thence sinking in northern Russia till its border is largely covered by the waters of the Arctic Sea, the White Sea and Lakes Onega and Ladoga. Because this

region is slightly concave towards its centre under the northern arm of the Baltic Sea, and thereby resembles an inverted shield, it has been termed the Baltic Shield. It is one of the most ancient land surfaces on the globe, for it is composed of highly resistant granites, gneiss and crystalline schists which, although folded in the dim geological past, before life appeared upon the earth, have remained almost undisturbed during and since the Palæozoic Era. Faultings have let down parts where relatively small areas of Palæozoic sedimentary rocks have been preserved,

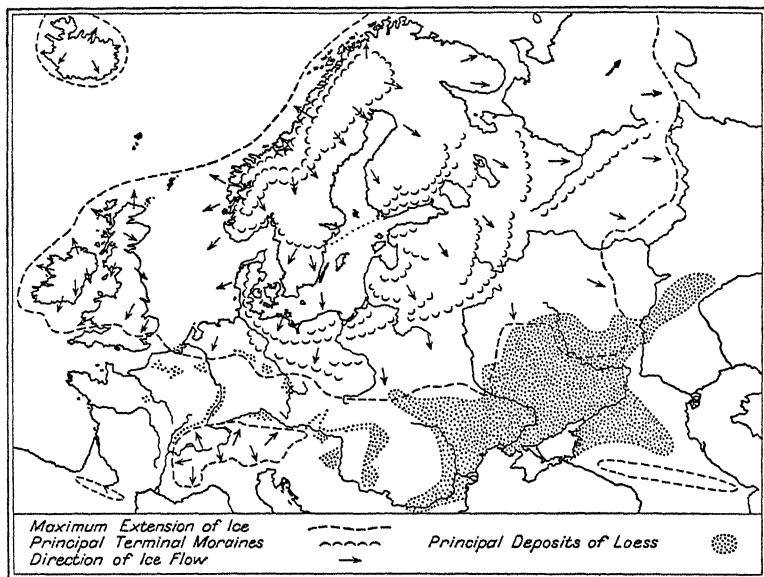


FIG. 3.—DISTRIBUTION OF GLACIATION AND LOESS.

and where the surface is rather lower than the rest, as, for example, in the "Lake Belt" of southern Sweden, in which are situated Lakes Vänern, Vättern and Mälaren.

For the most part the bed-rock forms undulating country in which the characteristic land-forms are due to glaciation. Near the southern margin there are long lines of hilly terminal moraines, behind which the glacial deposits are still so abundant and so recent that rivers have not been able to develop mature drainage systems. Their courses are irregular, and lakes are numerous. In central Finland, indeed, lakes and marshes cover much of the country and the roads make use of long,

narrow, winding ridges which stand above the waters; these are *âsar*, or eskers, trains of gravel and sand deposited beneath or on the margins of the ice-sheet.

Yet over large areas the naked rock is exposed, for much of the soil was scraped away by the ice and transported to the surrounding regions; nor was this loss remedied in the lower areas near the Baltic Sea and the Gulf of Bothnia by the deposit of sandy or clayey material when, for a time, the waters spread farther over the land.

Although the ancient rocks contain certain minerals, the Baltic Shield has proved a generally inhospitable region to man, even apart from its climatic conditions.

The Hercynian Uplands.—As the mountains of the north of the British Isles are akin to the Scandinavian Highlands, so the uplands of the south of Ireland and of the south-west of England and Wales are akin to a number of others scattered widely over the continent. They are known as the Hercynian Uplands because they represent fragments of mountain systems folded in the Hercynian earth-movements which occurred at the close of the Carboniferous Period. These mountains were continuous over great areas, though their traces are now found only in scattered fragments, and their folds ran in various directions. In the south-west of Britain and the adjoining region of Brittany, the general direction was about west to east with a trend to the south-east towards the centre of France, as is shown by the direction of the lines in these areas in Fig. 1; folds running in this direction are referred to as *Armorican*, from the ancient name of part of Brittany. In central Europe, however, the common direction is from south-west to north-east, termed *Variscan*, from the name of a tribe long ago living in the neighbourhood of the Fichtel Gebirge.¹ The Variscan direction is seen in the structure of the Rhine Plateau, which is cut across by the Rhine in its course between Bingen and Bonn, and also in the Harz Mountains, the Vosges and the Black Forest Mountains. In the Central Plateau of France both directions are seen, and still others appear in other regions, notably in the central tableland, or “*Meseta*” of Spain, in the “*Diamond*” formed

¹ Both the term “*Armorican*” and that of “*Variscan*” are sometimes used to denote all these foldings and all the regions of this type, but it seems best to restrict them as is here done, and to employ the term “*Hercynian*” in the general sense. “*Hercynian*” is derived from the old name of the Harz Mountains, one of the regions of this type.

by Bohemia and its margins, and in the Lysa Gora Uplands of Poland. Even in eastern Europe are two similar Hercynian areas, viz. the Donetz Plateau in the south, and the Ural Mountains, with their offshoot, the Timan Uplands, on the borders of Asia.

The various mountains formed by the Hercynian movements have had a history somewhat like that of the older Caledonian mountains; they were worn down to peneplains, so that the directions of the folds showed only in the strips of the various strata outcropping along the surface, like the graining of the wood in a sawn tree trunk. The Hercynian peneplains later suffered changes: over some areas they were depressed and upon them were laid down sedimentary rocks during the Secondary and early Tertiary Eras, and in the succeeding Alpine earth-movements they were considerably fractured, tilted, upraised or depressed.

Consequently much of what continuity they had previously shown has disappeared, only those parts which stand up above the surrounding lowlands being clearly recognizable as Hercynian Uplands of the usual type. These, which are shown as such on the map of structural regions in Fig. 1, were uplifted to plateau-like form, with more or less level surfaces, but denudation has since removed most of the overlying sedimentary rocks of Secondary and Tertiary date, and has exposed the older rocks of the peneplains with their graining; even in this older rock the less resistant strips have been etched out so that the more resistant stand up above the general level as ridges running in the direction of the original mountain-folds.

Where an uplifted mass is bounded by clearly marked, and more or less parallel, faulted edges, it is known as a "horst," and such structures are common in the Hercynian Uplands. The converse of a raised horst is a rift-valley, which has subsided between two parallel series of faults. One very important rift-valley is that in which the Rhine flows between Basel and Mainz; the parallel faults which bound it are shown in the map in Fig. 46, and the section in Fig. 47.

In many cases, uplands due to dislocation rise steeply on one side where they are bounded by marked faults, and descend more gently in other directions; structures of this kind are commonly known as "massifs" and are exemplified by the "Massif Central" or "Central Plateau" of France, which is fault-edged where it overlooks the Rhône Valley.

The dislocations which broke up the Hercynian areas allowed igneous material to be forced up along faults and through volcanic vents, and in several parts, notably in the Central Plateau of France, great sheets of lava and the remains of volcanic cones bear striking witness to this part of the history.

In the rocks of the Carboniferous Period which enter into the structure of the Hercynian regions, there were formed widely extending coal-measures containing seams of valuable coal, and these coal-measures were involved in the Hercynian foldings. Where they formed parts of the upfolds which were first denuded, the coal-measures have been worn away, but where they formed parts of downfolds or basins they have, to a certain

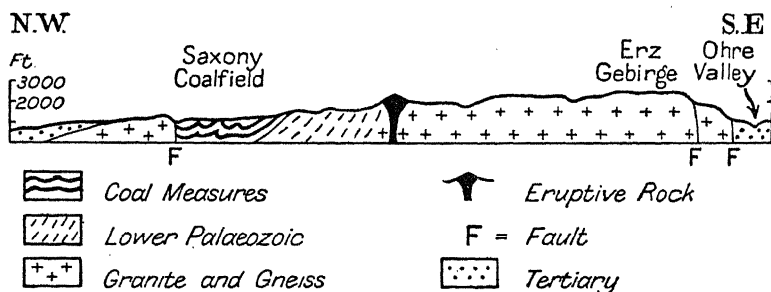


FIG. 4.—SECTION THROUGH THE SAXON UPLANDS, ERZ GEBIRGE AND EGER (OHRE) VALLEY.

extent at least, been preserved. Consequently there are important coal-fields associated with some of the Hercynian Uplands, and these, together with other mineral resources found in their exposed rocks, are the basis of mining and manufacturing industries which have attracted people to the mineral-bearing areas.

The structure of the Hercynian Uplands is illustrated in Fig. 4 by the section through the Erz Gebirge and Saxon Uplands; this area exhibits most of the elements described above.

Yet in general the Hercynian Uplands are not well populated, for they are not productive agricultural regions, since, as they stand above the surrounding lowlands, they have a relatively cool and moist climate, and also they do not usually bear fertile soils. Hence they naturally tend to be heath or moor lands or to be clothed with forests.

Central and Western Lowlands and Scarp-lands.—After the Hercynian earth-movements and the later wearing down of the resultant mountain systems, most of Europe, except the north, was submerged under the waters of seas or lakes. This submergence was, however, not uniform over the whole of the southern part of the present continent; some parts were beneath relatively deep seas in which was deposited the ooze from which limestones were formed, while other parts were covered by shallow seas or lakes in which clay-forming muds were laid down, while elsewhere sand was dropped which was changed to more resistant sandstones or remained in an unconsolidated form. Moreover, alterations in the depths of the various parts brought differing conditions first to one region and then to another, and thus at a given place there might occur first the formation of sandstones, then of limestones, and later perhaps of sands or clays.

Thus over wide areas of central and southern Europe there was a succession of deposits of varying composition during considerable parts of the Secondary and Tertiary Eras, and consequently thick strata of sedimentary rock covered platforms of more ancient formation.

Where, in the Alpine earth-movements, the platforms and their coverings of Secondary and Tertiary sediments were broken and upraised, the Hercynian Upland regions were formed as has been described above, but in the less-disturbed areas the strata remained at a lower elevation and the sedimentary cover was less exposed to denudation. In central and western Europe this was the case between and around the blocks of the Hercynian Uplands, where basins were formed such as those of south-eastern England and northern and south-western France, or where there were broader depressions, such as that on the southern shores of the North Sea and the Baltic Sea; in these regions the older rocks are still covered by a succession of sedimentary strata lying above one another in more or less saucer-like form or in an almost horizontal position, as is shown in the section through northern France in Fig. 38.

In other parts the rocks have a pronounced tilt, as in England west of the London Basin, in France west of the Vosges Mountains and in Germany east of the Black Forest Mountains; in such cases the less-resistant strata have been worn away, leaving the more resistant as long, tilted slabs, and giving to the

whole region a scarp-land character. This structure is shown in the section in Fig. 48.

Moreover, in the Ice Age, parts of these lowlands were invaded by ice, especially from the North-western Highlands, as was described above, and in such parts various deposits of clays, sands and gravels were laid down.

Frequently, fertile soils have developed upon the rocks of the lowlands and scarp-lands, and agriculture and pastoral work are carried on in such forms as the generally favourable climatic conditions have allowed.

Exceptional fertility marks the soils which have been derived from a mantle of loess covering the earlier deposits in certain parts of the central and western lowlands, and over a great area in south-eastern Europe (see Fig. 3). This loess resembles that of China in its composition; it is fine-grained, loose and sufficiently porous to allow a free downward drainage of water after rain, and a slow upward movement by capillary-action in dry weather. Its existence in Europe is due to dry climatic conditions which occurred during and after the Ice Age, when southward-blowing winds raised clouds of dust from the finely ground particles of the moraine areas, and deposited them over the surrounding lowlands until a layer was accumulated, in the west often to a depth of scores of feet, and in the east to much greater depths. In central and western Europe the existence of the loess was specially important during the period of man's early settlement and cultivation of these regions, for loess areas were usually free from forest, easily worked and gave abundant return to the simple forms of agriculture then practised.

Minerals are not characteristic of the later sedimentary rocks, though iron ores were formed in some of the Secondary strata (again see Fig. 6), and lignite deposits are found in some of the Tertiary. Yet where the older rocks of the Hercynian Uplands dip down beneath the edges of the basins, the coalfields may extend beneath the younger strata, and therefore in several cases coal-mining has spread from the Hercynian margins some distance into the neighbouring lowlands.

Because of the subsidence of the basins and hollows, the waters of the Atlantic have invaded the lowest parts, and oceanic inlets or inland seas adjoin these lands and bring opportunities for fishing and trading. Hence the lowlands and scarp-lands of central and western Europe have varied resources, and as a

whole have become the most densely populated parts of the continent.

The Regions of "Alpine" Folding.—Great as were the changes brought about by the Alpine earth-movements in northern and central Europe, they were but small compared with those which entirely transformed the southern part of the present continent.

It appears that during a very long period about the middle of the Tertiary Era, the block of the earth's crust which forms northern Africa moved northwards towards the similar block forming the platform of ancient and resistant rock which in central Europe underlay the sedimentary strata of Secondary and early Tertiary date. The northward movement was irresistible: the older rock structures of central Europe were broken and displaced, while the younger, sedimentary strata of the south were contorted in a most complicated fashion.

In a general way it may be said that massive sheets of limestones and other sedimentary rocks were ridged up into folds along lines which formed great curves, as indicated in Fig. 1. These curves appear to sweep round from the south of Spain across the Strait of Gibraltar into the Atlas Mountains of northern Africa, whence they are continued across the central narrows of the Mediterranean Sea into Sicily and through the Apennine backbone of Italy into the Alps; even the Pyrenees and the Cantabrian mountains of northern Spain are linked with this system, which therefore almost completely encircles the area of the western Mediterranean. A small spur from the Alpine system is seen in the Jura Mountains.

On their eastern side the Alpine folds appear to spread out, both to the north-east in the Carpathian system and to the south-east in the Dinaric Alps, thus enclosing the lowlands of the middle Danube. The southern part of the Carpathian system swings round into the Balkan Mountains, so that between these and the southward continuation of the Dinaric Alps is another enclosed area in the neighbourhood of the northern part of the Ægean Sea. An eastward continuation of the Balkan Mountains is probably to be seen in the Yaila Mountains of the Crimea and in the Caucasus, while those of the southern part of the Balkan Peninsula are continued in the islands of the southern Ægean and curve again into the mountains of Asia Minor. Indeed, the whole system extends east-

ward, across Asia on a still greater scale and culminates in the highest ranges of the world.

The term "folded" is, however, inadequate to describe the contortions which the strata have suffered (see Fig. 5). They have been squeezed together in most complicated ways, and on the outer side of many of the curves, sheets of rock (called "nappes") measuring hundreds or thousands of square miles in area, have been thrust bodily forward over other strata till

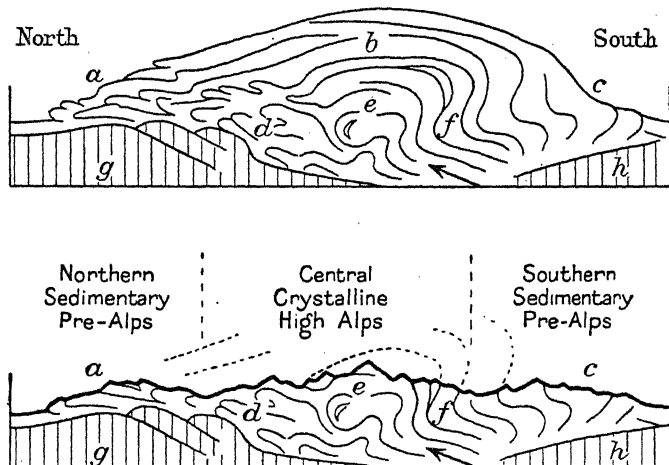


FIG. 5.—DIAGRAMMATIC SECTION THROUGH THE EASTERN ALPS.

(Vertical Scale greatly exaggerated.)

Note.—The upper diagram shows in a simplified form the contortions due to a thrust from the south. The underlying platform, *g* and *h*, is dislocated; the lower sedimentary rocks, *d*, *e* and *f*, are metamorphosed into crystalline nappes; the sedimentary nappes of the upper strata, *a*, *b* and *c*, are thrust northward (except in the extreme south), far from their roots.

The lower diagram shows the present constitution of the Eastern Alps after great denudation. In the central zone the crystalline nappes are exposed, and in the northern zone the sedimentary strata are left widely separated from their counterparts in the south.

they have been parted from their "roots" and now lie in regions far distant from those in which they were formed.

Under the pressures which have brought about such movements, some of the rock was metamorphosed into crystalline form; for example, a large part of the central Alps is composed of crystalline rocks which were thus formed. In some parts, too, molten material was forced up from the depths, and igneous rocks thus add to the complexity. Moreover, volcanoes were formed and are still to be observed, and even now earthquakes show that stability has not yet been attained in this part of the earth's surface.

The Alpine foldings have not only affected sedimentary rocks ; within them have been enclosed masses of older date and more resistant composition. For example, in the central Alps themselves are large areas, including the Mont Blanc massif, consisting of splinters of an Hercynian floor driven up into the folded pile above ; again, in the system of the Carpathians (in the wider sense of the name) is the great and ancient massif of the Transylvanian Alps as well as ancient fragments on the west of Transylvania and in parts of the Tatra Mountains.

Other blocks or massifs occur within the folded mountains of southern Europe, notably that between the Balkan Mountains proper and the western heights of the Balkan Peninsula ; here is the massif of which the Rodopi Mountains form the highest part. Again, within the curved folds of the western Mediterranean, there stand up ancient massifs forming the greater part of the islands of Corsica and Sardinia.

Another very marked, and very important, feature of the region affected by the Alpine foldings is the formation of great basins within the mountain system. These are of varying depth : in the western Mediterranean subsidences have let down the earth's surface over 10,000 feet below sea-level ; the Adriatic Sea, however, is relatively shallow, especially in its northern part, and the North Italian Plain is essentially a continuation of this depression now just above the level of the sea. The Ægean Sea occupies another area of subsidence ; it is "half-drowned," and the higher parts of the previously continuous mountain chains form the islands which appear as stepping-stones between the Balkan Peninsula and Asia Minor. The southern part of the Black Sea is another well-marked basin ; the north-western edge of the deeper area is the line of shallows showing the earlier connection between the Balkan Mountains and those of the Crimea.

A less-marked basin is that between the Balkan Mountains and the Transylvanian Alps where the relatively recent deposits forming the Walachian Plain stand above sea-level, and thus resemble those of the North Italian Plain.

Broadly similar in origin are the lowlands between the Alps and the great curves of the Carpathian system.

The Alps themselves, and to a less extent other parts of the great fold-mountains, reach such heights that, during the Ice Age, they bore ice-sheets which overrode the highest parts, and

in the case of the western Alps extended into neighbouring regions. The complex results of glaciation in the Alpine Lands and the Alpine Forelands will be described in later chapters.

The effects of the geological history on other conditions than structure and relief are very great ; we can here only hint at a few of the results. There is the existence of the Mediterranean and Black Seas which separate Europe from Africa and southern Asia ; these seas have physical influences, such as their warming influence upon the winter climate of the neighbouring lands, and influences upon human life, such as the way in which they have enabled civilization to spread all around their habitable coasts.

Corresponding to the variety in the rock structure and the relief of southern Europe is the variety of resources which include mineral deposits, Alpine pastures, mountain forests, broad inland lowlands and hill-sides facing the seas, all capable of human utilization ; thus the extraordinary complexity of the geological history has been followed by an extraordinary complexity in the conditions of human life.

The Russian Platform.—In eastern Europe the physical development and the human history have been quite different. The ancient rocks of the Baltic Shield dip gently south-eastward, and form the substratum of the great structural region known as the Russian Platform. Apart from its margins, where there are the Hercynian areas of the Ural and Timan Mountains and the Donetsk Block, the whole area between the Caledonian Highland system and the fold-mountains of the Crimea and Caucasus has remained almost unaffected by the later disturbances, and the most important movements have been relatively slight alterations in its general elevation as compared with sea-level. Because of these alterations, the area has been covered by the waters of seas of varying extent, and hence the ancient rocks which continue those of the Baltic Shield are covered in the north-west of Russia by deposits of Palæozoic age, while farther to the south-east these are followed first by Secondary, and then by Tertiary, strata.

But because these deposits have lain almost undisturbed, they have not been subjected to pressures which would have changed their character, and in general even the oldest remain in much the same condition as those of recent formation ; stone

which could be used for building or road material is a rarity over large areas of Russia.

The region is not of uniform elevation ; the Valdai Hills are over 1,100 feet above sea-level and form part of the water-parting between the rivers flowing north-west to the Arctic and Baltic Seas and those flowing south-east to the Black and Caspian Seas. The greater part of eastern Europe is less than 600 feet in height, while the land immediately north of the Caspian and the surface of that great inland lake are below the general sea-level of the globe.

Moreover, there have occurred warpings of the underlying platform which, although very slight if measured in degrees of slope, when continued over the great distances of eastern Europe have important consequences. The most marked of these warpings occurs in the south-west, where it brings up to the surface a belt of granite (Fig. 1) ; through this resistant mass the Dnieper River has been able to cut its southward reach only incompletely, and there are rapids which prevented navigation, but gave water-power now used for industrial purposes.

It must also be observed that all the northern part of the region has been glaciated, with results similar to those found in the plains of the central and western parts of the continent.

Because of its uneventful history, the Russian Platform has in general lacked the formation of mineral ores. Apart from some coal in the Palæozoic strata near Moscow and iron in the granitic belt, the chief minerals are in the Hercynian areas of the Donetz and the Urals, where industrial development can utilize resources lacking over most of European Russia.

One consequence of the geological history is of the first importance. Undisturbed by the great forces which have led to such a complicated relief in the rest of Europe, the east has remained open, level country in close physical association with the similar lands of western Asia, for the Ural Mountains do not form an effective barrier of any kind. Hence the climates of western Asia are continued across "Trunk Europe" about as far as "Peninsular Europe." Similarly, the belts of natural vegetation, i.e. the tundras, the forests, the steppe-lands and the semi-deserts, extend unbroken from Asia across eastern Europe. Consequently peoples who have adapted their ways of life to each of these types of vegetation have worked their way, either westward or eastward, along almost the whole extent of the

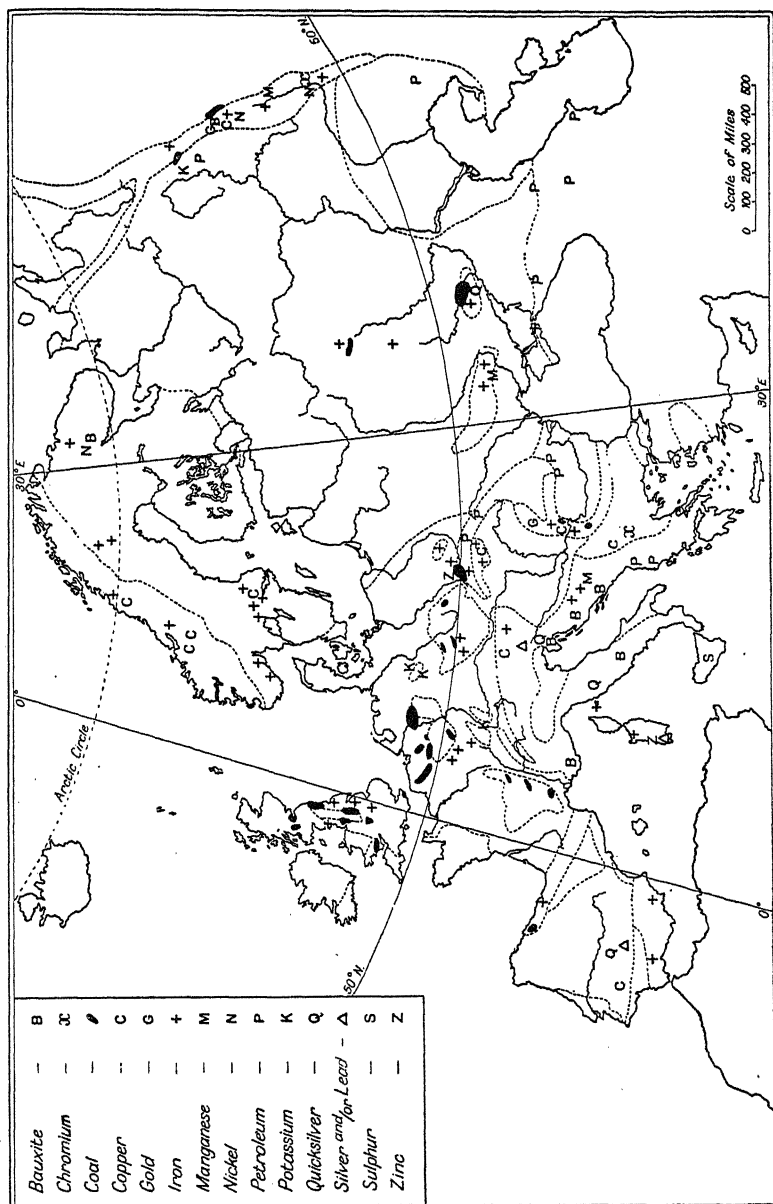


FIG. 6.—PRINCIPAL MINERAL WORKINGS.

Note.—There are also numerous lignite workings, especially in central Europe.

belts, and so kept western Asia and Trunk Europe in very close association from the human point of view.

The Caspian Basin.—Here is a region which is certainly more “Asiatic” than “European.” It is a part of a great depression which includes the three inland seas: Caspian, Arai and Balkash. To this hollow flow the waters of the surrounding higher lands, and to the Caspian Sea the Volga brings the drainage from a large part of eastern Europe. With the water is brought down the material worn away by the rivers, and the Caspian Basin is covered partly by such recent alluvium and partly by deposits formed when a greater sea than the present one occupied the area.

Moreover, the formation of the Caspian depression, in causing the greatest river of Europe to flow, not towards the Mediterranean, but to the south-east, and to end in a lake without access to the oceans, has tended to hinder close association between eastern Europe and the remaining part of the continent.

QUESTIONS

[At the ends of chapters where space allows, questions have been added, to bring out facts or ideas which have special importance in those chapters or have a more general application.]

1. How much knowledge of the Ice Age do you consider necessary in order to understand the present-day geography of the northern half of Europe? Illustrate by reference to particular areas and their characteristics.

2. Certain parts of Europe may be referred to as being regions of “Alpine folding.” Make a sketch-map showing these regions, and consider to what extent they have geographical, and not merely geological, similarity.

3. What are the common structural characteristics of the “Hercynian Uplands,” and how do these characteristics affect their utilization by man?

4. Distinguish between four types of coast on account of their structure, and state their location in Europe. Give a description of any two of these types.

5. Define “Trunk” and “Peninsular” Europe respectively, and explain the fundamental causes of the contrasts between these areas.

CHAPTER II

CLIMATE

Wind Systems.—Over much of Europe, oceanic influences play a very great part in determining the climatic conditions, and the belts of wind systems which are developed over the oceans are therefore important. Since these belts lie in certain latitudes, the position of Europe as regards latitude must be first noted. On its southern margin, Europe forms the northern part of the Mediterranean area; Gibraltar is about lat. 36° N. In the north of Europe the Scandinavian peninsula extends well beyond the Arctic Circle; North Cape is about lat. 71° N.

As a consequence of this position, all the continent except the east, i.e. Peninsular Europe as distinct from Trunk Europe, comes under the influence of the great system of winds known as the "westerlies," which appear on wind maps as blowing from a more or less westerly direction, that is, from the neighbouring Atlantic Ocean, whose waters are exceptionally warm for their latitude because they have been brought from tropical regions by the Gulf Stream Drift.

It may therefore be deduced that the climate of Europe, in so far as it is determined by these westerly winds, is not only made equable, but on the average is exceptionally warm for its latitude; further, it may be deduced that these winds bring water-vapour which is precipitated as rain or snow over the land, especially on the windward side of the highlands.

But though there is truth in these ideas, there is the complication that the westerlies are not by any means constant, even in those parts where the maps show that the prevailing winds blow from the west in all seasons. In England, for example, the "prevailing" winds may be shown on a climate map as coming from the south-west, but this is the actual direction of the winds only for about 20 per cent. of the observations. Indeed, the most characteristic fact about the winds experienced in England is that they frequently change, depending upon the passage of low-pressure systems called "lows," "depressions" or, less

frequently, "cyclones," or upon the development of high-pressure systems or anticyclones.

Hence the belt of the westerlies may be usefully considered as a belt in which depressions are common and travel in a generally west-to-east direction. In these depressions are two main streams of air, one coming from a south-westerly or

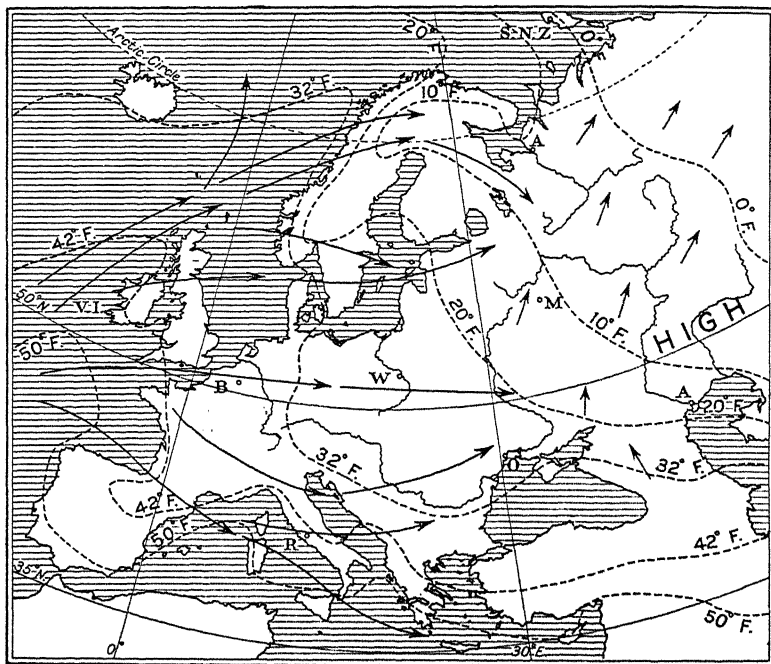


FIG. 7.—JANUARY "LOW" TRACKS, WINDS AND ISOTHERMS.

Note.—The long arrows show the common tracks of the centres of depressions. The short arrows show the prevailing winds in eastern Europe. The broken lines show isotherms of the mean January temperatures reduced to sea-level.

southerly direction and bringing warmth and usually rain, the other coming from a north-westerly, northerly or easterly direction and bringing cool and dry weather. As the depressions pass over a given place, there are accordingly changes in the weather as the warmer and the cooler air-streams cover the area in turn; on the whole, however, the "lows" bring rain, and on their southern side warmth, although cold weather may be found on their northern side. Since the centres pass most frequently over the northern part of Europe, it is their southern sections, with warmth and rain, which most affect the continent.

As the central parts of depressions are areas of low air-pressure, the regions over which they are most commonly found necessarily appear on maps showing the average barometric pressures as areas of lowest pressure, e.g. that between Iceland and north-western Europe.

On the contrary, anticyclonic conditions are marked by high

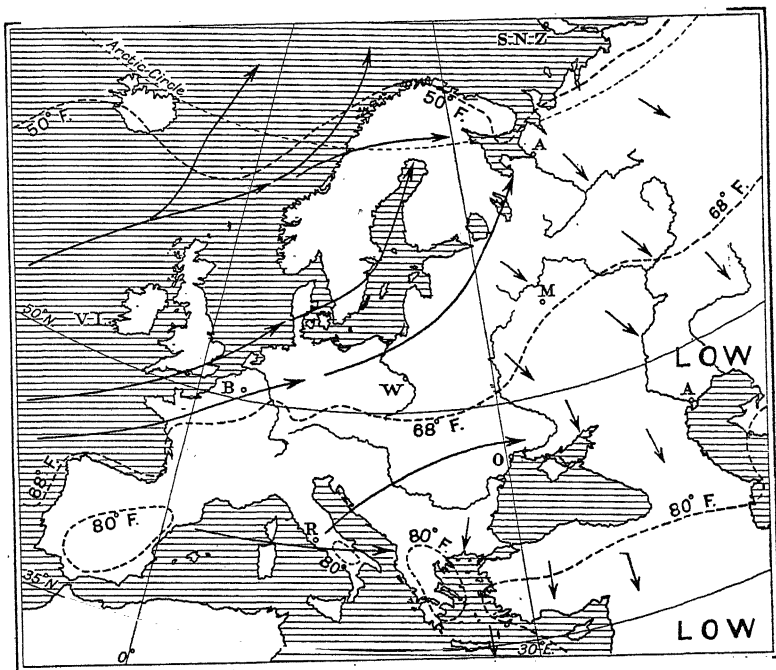


FIG. 8.—JULY "LOW" TRACKS, WINDS AND ISOTHERMS.

Note.—The long arrows show the common tracks of the centres of depressions. The short arrows show the prevailing winds in eastern Europe. The broken lines show isotherms of the mean July temperatures reduced to sea-level.

pressures, gentle winds or calms, and dry weather. Such conditions only occasionally develop within the belt of the westerlies, but they are more common on the southern side of this belt, that is, in the sub-tropical latitudes to the south of Europe, where the climate maps show relatively high average pressure.

Hence, one may shortly say that western Europe is in general under the influence of the belt of the cyclonic, rainy westerlies, while to the south of Europe lies the belt of sub-tropical calms and droughts.

The two belts, however, are themselves not always in the same latitudes, but shift with the sun, southward in winter and northward in summer. Consequently in winter the westerlies cover the whole of western Europe, and their depressions may fairly often pass over the Mediterranean area. In summer, on the other hand, the depressions leave the Mediterranean relatively free, especially in the east, and the south of Europe frequently experiences the calms and drought of the sub-tropical belt of high pressure.

In Figs. 7 and 8 the long arrows show the tracks commonly followed by the centres of "lows," but it must be understood that the area covered by a depression is normally very considerable; if the centre passes over Berlin, for instance, its influence would probably extend from central Scandinavia in the north to the northern Adriatic in the south. Bearing this in mind, it will be seen from the maps that in winter cyclonic conditions characterize the whole of Peninsular Europe, while in the summer they are generally less frequent, particularly in the Mediterranean region.

In eastern or Trunk Europe the depressions have less influence, for they tend to pass over seas rather than lands, and when they do penetrate the great land-mass, they diminish in intensity. The climate of eastern Europe is therefore more closely related to that of Asia; it is marked by a reversal of the conditions as between summer and winter which is associated with the monsoonal changes of the greater continent.

In summer the heat sets up a system of continuous low pressure over Asia towards which the winds blow inwards, though deflected, by the earth's rotation, to the right of the most direct path; consequently in the east of Europe they commonly blow from a more or less north-westerly direction, as is shown by the short arrows in Fig. 8. Even in the eastern Mediterranean this influence is felt, and the prevailing northerly winds of this season were there known to the ancient Greeks as the "Etesian" or "annual" winds, whose onset marked the beginning of uninterrupted easy navigation for their small ships.

In winter the continental land-mass is cooled, high pressure is more continuously developed and the air tends to move outward. The winds, deflected to the right of their direct outward path, usually blow from a more or less southerly direction over most of eastern Europe (see Fig. 7), though in the Mediter-

anean region they are more frequently interrupted by the passage of cyclones.

Temperatures.—The wind systems combine with the direct heating effect of the sun to determine the temperature conditions.

In the summer the sun's direct influence is the greater, as may be seen from Fig. 8, in which are shown the isotherms drawn from the records of the mean monthly observations of air temperatures in July. (To simplify the maps, the temperatures have been reduced to sea-level; consequently the uplands and highlands have cooler conditions than are indicated.) Where the sun is relatively high in the sky, that is, in southern Europe, the heat is greatest, and over the southern parts of the three peninsulas the lowlands have mean temperatures at, or even over, 80° F. during July. In the far north the temperatures are at about 50°. The course of the isotherm of 68° is worth noting: in the Atlantic area it is well to the south of latitude 50°, for the ocean is relatively cool; in eastern Europe it passes considerably to the north of this latitude because the continental mass is greatly heated by solar radiation; in central Europe the isotherm runs almost along the line of latitude, and places east and west of one another have about the same summer temperatures.

It is convenient to say that when the mean temperature is above 68° F. (20° C.) the climate is "hot"; when between 68° and 50° F. (20° and 10° C.) it is "warm"; when between 50° and 32° F. (10° and 0° C.) it is "cool"; and when below 32° F. (0° C.), it is "cold." Adopting these terms, we may point out that the temperature map shows that in July the climate of most of Europe south of latitude 50°, together with all south-eastern Russia, is hot, that of most of Europe north of latitude 50° is warm, but the lands adjoining the Arctic Sea are cool.

The January map indicates marked contrasts, for in the latitudes of Europe the winter sun is visible for a shorter time in the day and is lower in the sky than in the summer; consequently the sun has much less effect and the winds have relatively more influence, as they bring warm air from the Atlantic Ocean.

The isotherm of 50° is now the highest and, away from the Atlantic, only the southern Mediterranean lands have this temperature. This is due partly to the latitude and partly to the influence of the Mediterranean Sea itself, for this sea remains remarkably warm in the winter because it is shut off

TABLE OF CLIMATIC CONDITIONS

Climate Region	Station	Lat. N.	Height above Sea-level (Feet)	Temperatures (Deg. F.)				Precipitation (Inches)				
				Mean Monthly		Mean Annual		Annual Total.	Seasonal Totals.			
				Jan.	July	Min.	Max.		Win. D.J.F.	Spr. M.A.M.	Sum. J.J.A.	Aut. S.O.N.
Arctic	South of N. Zemlya	72	50	2	44	—	—	6	0.9	0.8	2.2	1.7
Boreal	Haparanda Archangel	66	10	11	59	—27	81	19	4.0	3.2	5.4	6.6
		65	50	8	60	—32	84	17	2.5	2.7	6.6	5.0
Sub-boreal	Stockholm Moscow	59	150	27	62	—2	83	21	4.6	4.2	7.0	5.5
		56	500	12	66	—17	88	21	3.5	4.6	7.7	5.2
Oceanic Temperate	Bodö	67	10	30	55	7	75	36	9.1	6.3	7.7	12.5
	Bergen	60	70	34	58	12	79	84	24.5	15.2	17.6	27.0
	Valentia Is.	52	30	45	59	28	72	56	17.3	11.4	11.8	15.2
	Brest	48	180	43	64	23	90	32	9.5	6.2	6.2	10.5
	Santiago	43	890	45	66	28	95	65	21.7	17.1	6.9	19.1
Mid-Temperate	London	51	20	39	63	18	88	25	5.6	5.2	7.3	7.0
	Brussels	51	200	34	63	14	88	30	6.6	6.0	8.7	8.3
	Paris	49	160	37	65	12	93	21	4.1	4.8	6.0	5.9
	Karlsruhe	49	390	33	66	8	91	38	7.3	8.7	12.1	9.7
	Lyons	46	570	36	70	10	95	40	7.0	8.7	10.1	11.1
	Milan	46	480	34	75	14	93	40	7.7	10.2	9.3	12.5
	Bordeaux	45	250	41	68	18	95	33	8.0	8.0	7.4	10.0
Interior Temperate	Königsberg	55	20	27	63	—2	90	25	4.1	4.6	8.8	7.8
	Berlin	52	160	31	64	7	91	23	5.0	5.0	7.6	5.1
	Warsaw	52	440	26	66	6	90	22	3.8	4.7	8.5	5.0
	Munich	48	1,700	27	63	0	86	35	4.8	8.6	14.2	7.6
	Budapest	47	500	28	70	10	91	25	4.6	7.0	7.0	6.7
	Sofia	43	1,800	27	69	2	95	26	4.3	7.1	8.0	6.2
Mediterranean	Genoa	44	180	45	75	28	90	52	13.2	11.7	6.9	20.3
	Marseilles	43	250	43	72	21	91	22	5.2	5.2	2.8	8.3
	Rome	42	160	44	77	27	95	32	9.8	7.7	3.2	11.9
	Oporto	41	270	48	67	32	93	48	15.8	13.4	3.4	15.4
	Madrid	40	2,100	40	76	18	104	16	4.0	5.4	2.1	4.9
	Valencia	39	70	49	75	32	99	19	4.5	4.8	1.6	8.2
	Palermo	38	230	50	76	39	99	29	11.7	6.7	1.5	9.3
	Athens	38	350	49	81	28	100	15	5.9	2.9	1.4	5.2
Steppe	Orenburg	52	360	4	72	—23	97	15	3.1	3.3	5.0	3.7
	Odessa	46	210	26	73	0	91	16	2.9	3.5	5.6	4.1
	Bucharest	44	280	25	73	—4	95	23	4.0	6.2	8.0	4.9
Arid	Astrakhan	46	—50	19	77	—15	97	6	1.3	1.5	1.7	1.3

Note.—Königsberg is now Kaliningrad, and Warsaw is Warszawa.

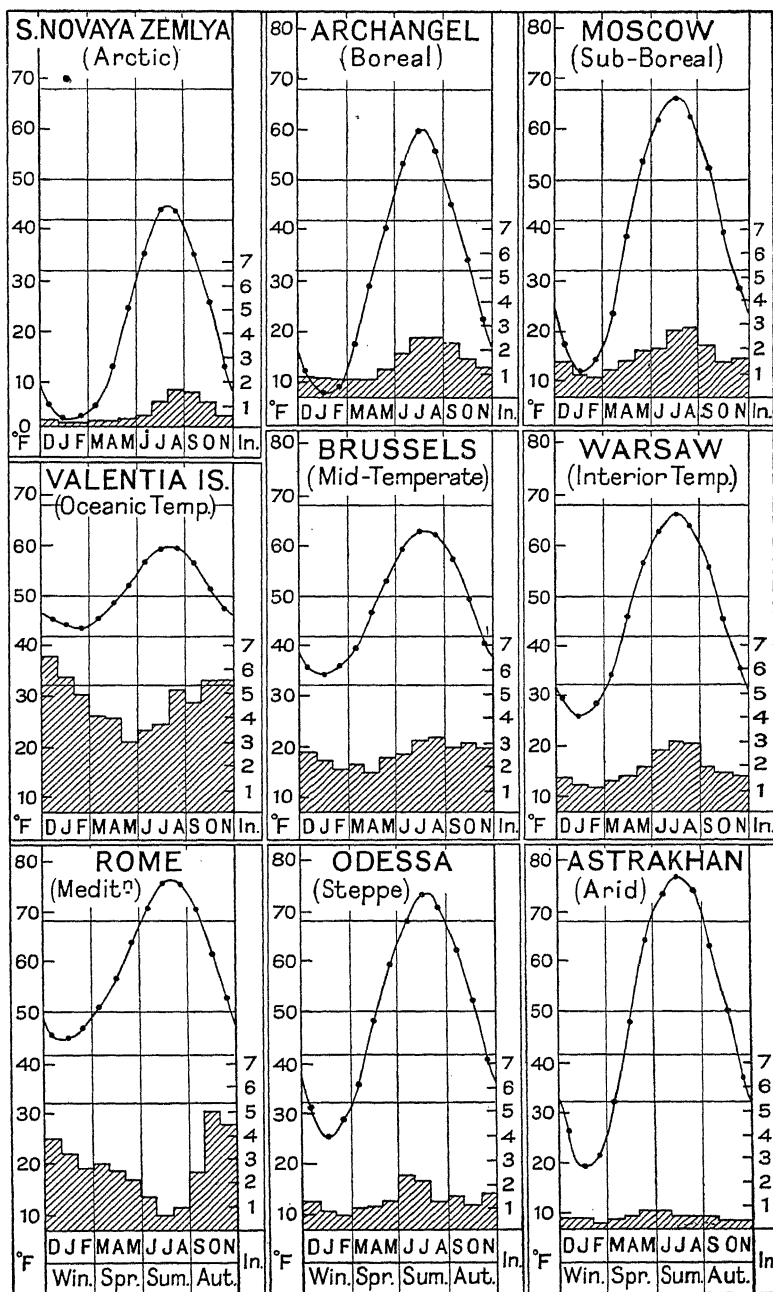


FIG. 9.—TEMPERATURE AND RAINFALL GRAPHS OF CLIMATIC TYPES.

from the cold waters in the depths of the Atlantic by the narrow and shallow entrance at the Strait of Gibraltar.

Most of the other isotherms of the January map have a course broadly similar to that of 50° : in the Atlantic area they run from north to south, showing that the oceanic west is warmer than the continental east, while towards the interior of Europe they run more from west to east because it is colder in the north, where the sun has very little effect.

The isotherm of 32° F. is of special interest, for it marks out an area to the east and north of it where, during a normal January, the average temperature is below freezing-point. As a consequence, within this area, precipitation in January normally takes the form of snow instead of rain, and if the snowfall is heavy there is a snow-cover to the land lasting for at least a month. Moreover, except in a narrow belt adjoining the course of the isotherm, inland waters are normally frozen over and harbours are closed by ice for a month or more; the chief exception to this latter rule is that the warm Atlantic waters drifting along the coast of Norway keep the harbours of all the west coast of Scandinavia open throughout the year. The extremely cold winters in north-eastern Europe should be observed; in the neighbourhood of the northern Ural Mountains the mean temperature in January is 0° F., i.e. 32° below freezing-point.

Employing the terms "cool," "cold," etc., as stated above, we may summarize the conditions in January by saying that in eastern Europe as a whole, together with most of Scandinavia and the eastern part of central Europe, the climate is cold; in most of western Europe it is merely cool, while the south of the Mediterranean area has even warm conditions in this month.

By comparing the mean temperatures in January with those in July, as shown either on the maps or in the table on p. 26, it may be seen to what extent the climate of any place may be regarded as extreme or equable. Subtracting the figure for January from that for July, the annual range is obtained: e.g. for Valentia Island it is only 14° , for Warsaw it is 40° and for Moscow it is 54° . A climate with an annual range of about 30° or less may be regarded as equable, and western Europe as a whole and most of the coast-lands around the Mediterranean Sea have an equable climate. One with an annual range of over 40° is extreme, and all eastern Europe has an extreme climate.

Between these well-marked types comes central Europe, transitional in this respect.

The map of mean temperatures for January shows the average reading of the thermometer in that month, but the actual conditions are at some times above, and at other times below, this average; hence the winter temperatures are at times more severe than the mean temperature suggests. The lowest temperature which is normally experienced in winter (i.e. the average of the lowest taken over a number of years) is called the mean annual minimum, and for certain stations is given in the table on p. 26. In this table it will be seen that, for example, while the mean January temperature at Moscow is 12° F. (20° below freezing-point), the mean annual minimum is -17° F., i.e. 29° lower (49° below freezing-point). Again, at Archangel the normally lowest reading in January is -32° F. (64° of frost).

Similarly the July map shows the mean temperatures for that month, but the summer temperatures actually rise much higher than these; the table shows that while at Moscow, for example, the mean July temperature is 66° F., the mean annual maximum, which is the mean of the highest July readings, is 88° F. In the south of Europe the mean annual maximum at Athens is 100° , and at Madrid it reaches even 104° F.

All the conditions hitherto considered relate to those of the coldest or hottest months, but it is also important to know what is happening during other times of the year. This is to some extent shown by the graphs in Fig. 9, which indicate by dots the mean temperatures of each month and join these by curves depicting the normal "march of temperature" throughout the year. From such curves useful deductions may be made; for instance, at Moscow the mean temperature falls below freezing-point (shown by the line at the level of 32° F.) about the beginning of November and does not rise above it until about the end of March; we may therefore conclude that normally there is a period of frost lasting about five months. Similarly it may be deduced from the graphs that the period of frost at Archangel is about six months, while at Warsaw it is rather more than three months; a map showing by lines the lengths of the normal period of frost in all parts of Europe is given in Fig. 10.

Another example of the deductions that can be made from graphs of the normal march of temperature is the duration of the "warm" period, i.e. the time during which the mean

temperature is above 50° F. (10° C.). At Valentia Island, off south-west Ireland, the curve rises above the 50° F. line at the beginning of May, and falls below the 50° F. line again near the end of October; the warm period therefore lasts about six months; compare the curve for Archangel, where the warm period lasts only about three months. A map showing the

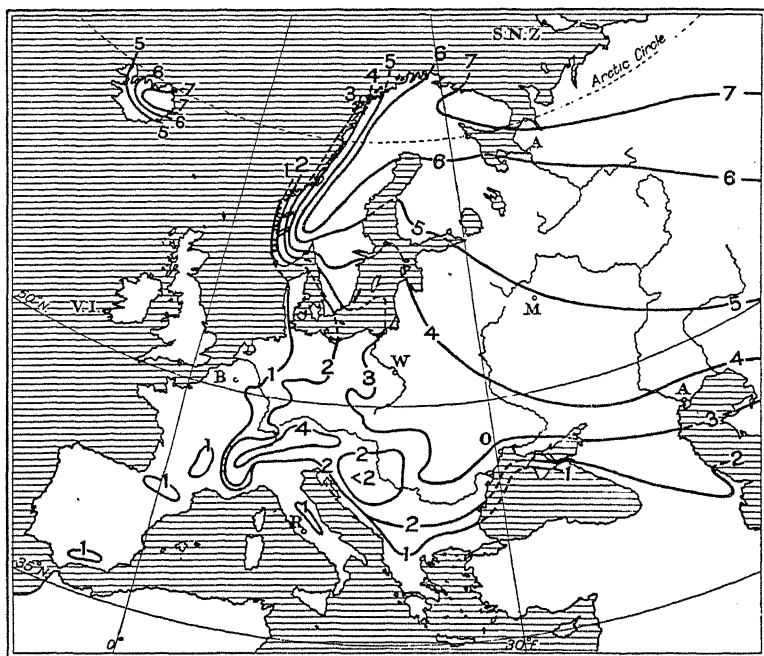


FIG. 10.—DURATION OF FROST PERIOD.

Note.—The lines show the number of months during which the mean temperature is below freezing-point (32° F., 0° C.), the calculations being based on actual temperatures (not reduced to sea-level). On the Alpine margins the lines of 3 and 4 months are so close that the former has been omitted, and for a similar reason the 1-month and 2-month lines have not been separately indicated on the margins of the SE. Alps and Dinaric Alps. Note that the area of the Central Danubian Lowlands, marked < 2, has a period of less than two months of frost.

duration of the warm period in all parts of Europe is given in Fig. 11.

From the point of view of the relation of climate to plants the mean temperatures for the hottest month give a very inadequate idea of the temperature conditions which affect growth. For example, the figures for July show that the mean midsummer temperature is about the same at Valentia Island as at Archangel, and yet the graph shows that the warm period is twice as long at the former place as at the latter.

An important fact regarding the relation of climate to plant-life is that for a number of plants growth can begin only when the mean temperature rises above about 42° F. (6° C.). This level is shown by another horizontal line on the temperature graphs, and it may be deduced from the curves that, for example, wheat can begin to grow earlier at Brussels than at Moscow, although the latter place has a higher midsummer temperature.

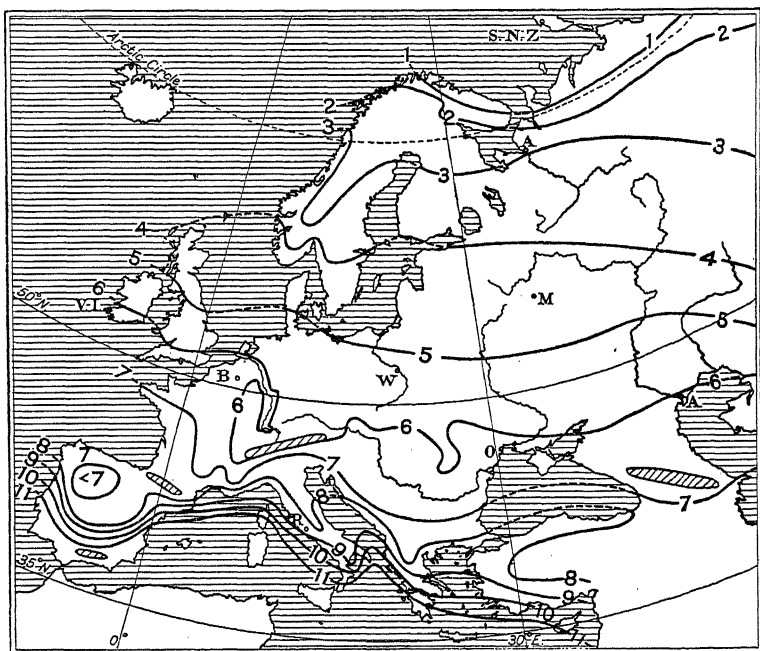


FIG. 11.—DURATION OF WARM PERIOD.

Note.—The lines show the number of months during which the mean temperature is above 50° F. (10° C.), the calculations being based on actual temperatures (not reduced to sea-level).

Conditions in the Alps and other high mountain regions vary so greatly that these areas have been excluded from the map. Note that in the interior of Spain an area marked <7 has a period of less than seven months of warmth.

Precipitation.—The next element of climate to be considered is precipitation in the form of rain or snow, and this study may well be begun in connexion with the wind systems for July and January respectively.

In July, depressions advance from the Atlantic over northern and central Europe, and since in them the warmer air from the Atlantic rises, it is cooled and water-vapour is precipitated in the form of "cyclonic rains." In eastern Europe the prevail-

ing winds come from the north-west, and have sufficient water-vapour for rain to occur, although in less amount than in the west (see Fig. 13). The greatest precipitation is on the highlands which compel the air currents to rise and to produce "relief rains." In the Mediterranean region and in southern Russia depressions seldom occur, and cyclonic rains are therefore slight, though relief rains give a rather better water-supply

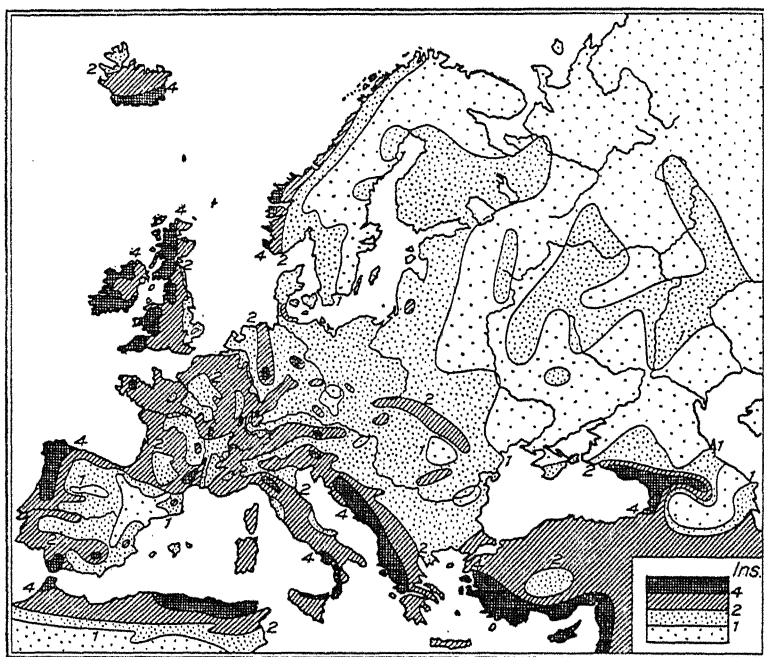


FIG. 12.—MEAN JANUARY PRECIPITATION.

to the mountains, especially to the Caucasus. In the far north there is little rainfall, even in connexion with the depressions, for the cool air can hold but little water-vapour and though the air is further cooled by ascent only a small precipitation can result.

Where cyclonic influence is weak, settled weather is the general rule, but during a period of such weather in summer there may occur thunderstorms and heavy rains, due to the relatively great heating and the consequent rising of the air in particular localities ; such " convectonal rains " account for a considerable proportion of the precipitation in central and eastern Europe.

In January, depressions normally affect the whole of the continent except the extreme east, and where the air is warm enough to contain much water-vapour, precipitation may be considerable. This is the case particularly along the Atlantic margins, where there are the heaviest rains, and in the Mediterranean region; moreover, on the highlands relief rains add to the total (see Fig. 12). But away from the relatively warm areas adjoining the Atlantic and the Mediterranean the air is so

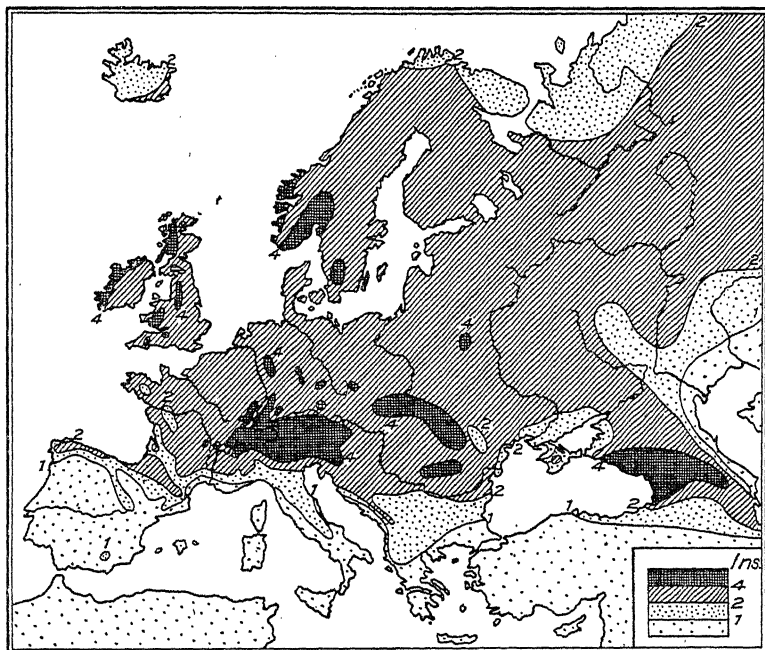


FIG. 13.—MEAN JULY PRECIPITATION.

cold that it can contain little water-vapour and precipitation is generally slight, though relief rains, or falls of snow, occur on the highlands. (In reading maps or statistics of precipitation, it must be remembered that in their compilation one foot of snow is taken as the equivalent of one inch of rain.) In eastern Russia the cold, out-blowing air from the Asiatic high-pressure area is necessarily dry, and this part of Europe would be rainless in winter but for occasional depressions.

The maps for January and July are in general indicative of the whole of the winter and summer seasons respectively; this

can be seen by the rainfall graphs in Fig. 9, in which the three winter months of December, January and February and the three summer months of June, July and August are marked off by vertical lines.

The rains of spring and autumn are equally important, but as they are to a considerable extent transitional between the more extreme conditions of winter and summer, they are more evenly distributed over the continent. Near the Atlantic and in the Mediterranean region, however, the autumn rains are frequently heavier than those of any other season. These statements about the rainfalls of spring and autumn should be verified by examining the graphs for the stations given in Fig. 9 and the accompanying page of statistics.

A useful summary of the distribution of precipitation during the year at any particular place can be made by adding together the amounts in each group of three months to get the totals for the four seasons respectively, and this has been done for certain places in the table on p. 26. Further, the total for the whole year for the selected stations is given in the same table, and the distribution of the total annual precipitation over the continent is shown by the map in Fig. 14.

By putting together the facts given in the maps, the graphs and the table, a fairly complete idea of the precipitation can be obtained, and some of the main conclusions may be summarized as follows: (i) The regions adjoining the Atlantic have a heavy rainfall fairly well distributed through the year, although greatest in autumn and winter. (ii) Central Europe has an annual total varying according to elevation, considerable on the highlands and moderate on the lower lands; on the whole, the rainfall is fairly evenly distributed through the year, although the greater amounts occur in summer and autumn and the tendency to a summer maximum increases towards the interior. (iii) Eastern Europe, including most of Scandinavia, has a rather small total precipitation with a summer maximum, and in the extreme north-east and south-east the amounts at all seasons are very small indeed. (iv) In the Mediterranean region the total annual rainfall varies from being very considerable on the highlands behind the Adriatic to being very slight over most of eastern Spain, but the common characteristic is that of summer drought; in the northern part of the

the south the period becomes longer and the intensity of the drought may be severe.

Indeed, throughout all southern Europe, including the south of Russia, the summer is normally a time of drought, for the high temperatures cause rapid evaporation, and the efficiency of what precipitation may occur is thereby greatly reduced. Conversely, in northern Europe evaporation is much less and the rainfall is correspondingly more effective.

Another important consideration is the variability of the rainfall from year to year. This variability is, in the main, greatest where the total amounts are least, and it is consequently quite considerable in the east and in some parts of the Mediterranean region. Moreover, while in a well-watered region a decrease from the average is not a serious matter, in the areas of scanty rainfall it may have calamitous results; thus, in particular years the normal summer drought of the Mediterranean may be unusually prolonged and may even become disastrous, while in southern Russia in years of sub-normal rainfall harvests fail and famines result.

One more point must be noted: when there is little rainfall either during the whole year or during one season of the year, that rainfall tends to occur in short, sharp downfalls; this is frequently the case in the Mediterranean region and with the summer thunderstorms of eastern Europe. A rapid fall means that the immediate run-off of water to the streams is great, and the plants cannot use so much of it; also, after the rain bright weather quickly follows, and evaporation may dispose of much of the water and thus further reduce the value of the already small precipitation. The rapid run-off, moreover, tends to wash away the soil, and therefore soil erosion is a serious factor in the utilization of the Mediterranean and other areas of short and sharp rainfall.

Other Climatic Elements.—The frequent passage of depressions over the Atlantic margin has effects upon the climate of that region besides the equability of the temperature and the heavy precipitation; there are, for instance, the facts that the winds are often violent and the sky covered with cloud. On the contrary, the relative absence of depressions in the Mediterranean region, even in winter, allows a clearness of the sky and an abundance of sunshine which are important factors in attracting visitors from north-western Europe. Similarly eastern Europe has in general clearer skies than the west.

The importance of the element of light in climate is, of course, great, and in this connexion latitude is the main factor. In northern Europe, which lies near and even beyond the Arctic Circle, there is a very marked contrast between winter and summer. In summer the days are very long, and within the Arctic Circle the sun is above the horizon for the whole of the twenty-four hours during a period which at the Arctic Circle is

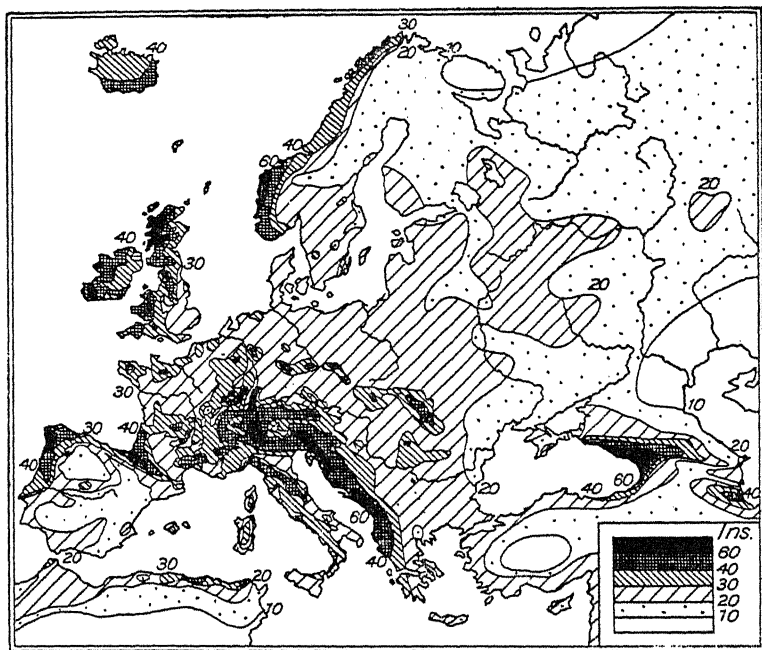


FIG. 14.—MEAN ANNUAL PRECIPITATION.

limited to one day, but at North Cape in Norway extends to over two months.

Conversely, at midwinter the sun is invisible at the Arctic Circle for twenty-four hours, and at North Cape for more than two months. Moreover, even during the short periods in winter when the sun is visible, it rises but little above the horizon.

Climate Regions.—The various elements of climate, e.g. winds, temperature, precipitation and light, of course all exist in the closest association; they influence one another and have a combined effect upon other geographical phenomena and upon mankind. Regarded in this way, climate is seen to differ very

markedly in different parts of Europe, and it is useful to divide the continent into several regions, in each of which the climate has distinct characteristics. Yet climatic regions seldom have definite boundaries, and it must therefore be emphasized that, when maps are made like those in Fig. 15, the various regions usually "shade off" into one another and the descriptions are only generalizations which apply best to the central parts of the respective regions.

It is convenient, however, to draw lines to serve as approximate boundaries of climatic regions, and for this purpose two devices are commonly employed. In the first place, there are lines based upon meteorological records, like those drawn on the maps showing the conditions of temperature and precipitation. Such lines may be without much significance if they are based merely upon some arbitrarily selected numbers, such as 68° F. (rather than 70° F.), or a duration of frost for one month (rather than three weeks), or a rainfall of 10 inches (rather than 12 inches). It is often better, therefore, to employ the second device, i.e. the adoption of some more natural indication of the climates, and for this purpose vegetation, either natural or cultivated, is a useful guide. In the following chapter the main types of vegetation will be described, and it will there be pointed out how these types are related to climatic conditions; in some cases it appears that the limits of the growth of particular plants correspond with a line indicating certain climatic conditions; e.g. the northern limit of trees is found where the period of warmth (over 50° F.) decreases to one month. Hence the line indicating this condition on the map in Fig. 11 has been adopted on the map showing climatic regions (Fig. 15) as separating the "Arctic" from the "Boreal" type of climate. (For the selection of names—"Arctic," "Boreal" etc.—as well as of the boundaries of the climatic regions, see the note appended to Chapter IV on p. 75.)

The conditions of the climates of Europe may now be summarized in the following paragraphs:

The Arctic climate is experienced around the Arctic Sea, and in the main within the Arctic Circle. Its "winter" is very long, with about seven months of frost, very cold, and for a considerable period almost sunless; for most of the year the ground is covered with snow, and the subsoil is always frozen. The "summer" is correspondingly short, and although at mid-

summer the daylight is practically continuous, the sun is low in the sky; consequently the mean temperatures rise little above the limit of plant growth, and that only for a short period. Most of the scanty precipitation comes during the time of relative warmth, and is therefore available for plant-life; moreover, evaporation is little and the "effectiveness" of the precipitation is considerable.

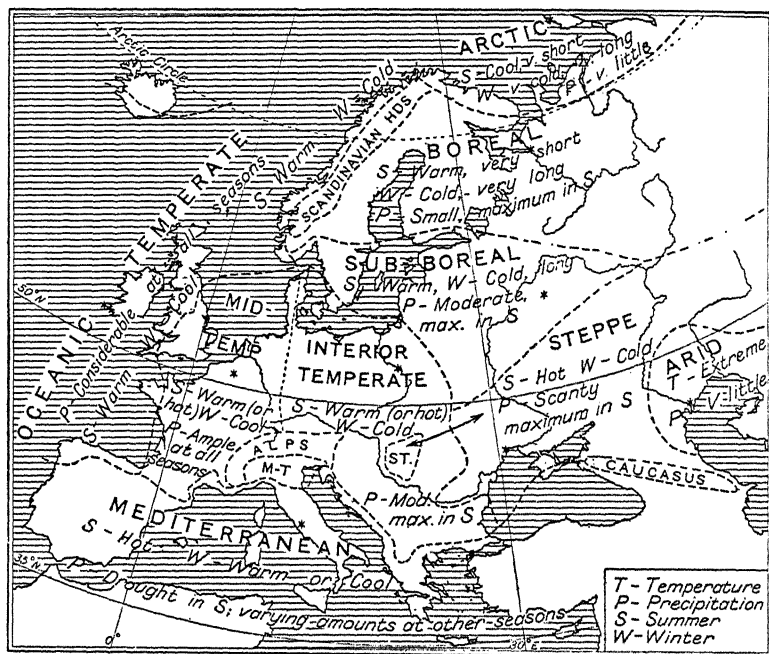


FIG. 15.—CLIMATE REGIONS OF EUROPE.

Note.—In all regions, the uplands or highlands show modifications of the general conditions, but the Alps, Caucasus and Scandinavian Highlands are shown as independent regions.

Except in areas of very marked relief, the boundary lines represent transitional belts rather than definite divisions between the regions. The asterisks indicate the situation of the stations for which graphs are given in Fig. 9.

The Boreal (northern) climate might be called *Sub-Arctic* because it extends over much of the northern lands of the world which border upon the Arctic Circle; in Europe the belt begins immediately behind the Scandinavian Highlands, which largely exclude it from Atlantic influences. The cold is about as severe as in the Arctic climatic region at midwinter, but it has a shorter duration, and the thick cover of snow due to the winter precipitation lasts for less than half the year. In spring there is a

rapid rise of temperature above the limit of plant-growth, and the summer has from one to four months of warmth, with a small but effective rainfall. The contrast between the light conditions in summer and winter is very marked, though not so extreme as in the Arctic region.

The Sub-boreal climate is transitional between those of markedly continental character and those largely influenced by the Atlantic Ocean ; it is experienced in a region in which Atlantic influence can just penetrate into eastern Europe, between the barriers of the Scandinavian Highlands on the north and the Alps and Carpathians on the South. The region is scarcely boreal in latitude, and is distinguished from its westerly neighbours by having a shorter summer ; it might therefore be labelled a *mid-latitude, short-summer* region—a term which may be applied to similar regions elsewhere in the world. The period of warmth lasts four months along the northern limit of this region, and increases southward. Also, during this period as well as during the rest of the year there is greater precipitation than in the boreal region. Hence conditions are more favourable for plant-growth, and for the utilization of the resources by man, than under the boreal type of climate.

The Steppe climate is a convenient label to apply to those conditions under which have developed the various forms of steppe vegetation which will be described in the next chapter. This type of climate, like all the others of eastern Europe except the transitional sub-boreal type, is definitely continental and extends far into Asia. The region might be described as being of the *mid-latitude, light-rain* type, for a scarcity of moisture during much of the year markedly affects its vegetation.

For about three months or more there is a winter during which the mean temperature is below freezing-point, and for a considerable period the ground is covered by snow. In spring there is a rapid rise of temperature above the limit of plant-growth, and this growth is aided by the melting of the snow-cover and by a moderate amount of rain. In summer the precipitation as recorded by a rain-gauge is greater, but it tends to occur in heavy and short showers, while the weather becomes "hot" (over 68° F.) for about three months ; consequently evaporation is great, the effectiveness of the rainfall is small, and the summer is a season of drought during which plant-growth ceases. In autumn, as in spring, the temperatures are moderate,

and the rainfall is consequently more effective ; yet it falls, upon parched ground, and a reawakening of vegetable life is soon followed by the cold of winter.

As the complex climatic conditions are closely reflected in the periods of growth and rest which are characteristic of steppe vegetation, the approximate limits of this vegetation are here taken as the boundaries of the region.

In addition to southern Russia, there is an area in the central Danubian Lowlands which has a climate of this type, and may therefore be regarded as an "exclave" of the main steppe region.

The Arid climate is characteristic of the Caspian-Aral depression in the heart of the Eurasian continent, and is therefore only experienced on the south-eastern margin of Europe.

While in the north of the continent it is low temperatures which cause limitation of certain forms of life and activities, and while in the steppe region both the cold in winter and also the drought in summer are the critical phenomena, here in the Caspian-Aral region the precipitation is so scanty, irregular and ineffective, that it is arid at all seasons and is of a *mid-latitude, desert* type.

That is not to say that the temperature conditions are negligible. In the first place, the ineffectiveness of the precipitation is due to the high summer temperature, for a rainfall of less than 10 inches per annum, which here marks out the arid region, is accompanied by wet surface conditions in summer in north-eastern Europe. In the second place, the extreme character of the climate is in itself of geographical importance ; during the year a "cold" winter, which lasts about three months, is followed by a spring in which the climate rapidly passes through the "cool" and "warm" stages to a summer during which the weather is "hot" for three months, while the mean and maximum temperatures are among the highest in Europe.

The Temperate climate.—None of the regions of eastern Europe has climatic conditions which can be considered "temperate,"¹ for they all experience either considerable heat or considerable cold at some season of the year. In the south-east, moreover, there is a period of deficient moisture, and this characteristic of seasonal drought exists also in the Mediterranean lands.

Only in north-western and central Europe is there a comparative moderation of climatic conditions throughout the year ; hence the term " temperate " is restricted to the climate of this region. Within this region, however, conditions are by no means uniform, and three varieties of the temperate climate may be distinguished in Europe.

The Oceanic Temperate climate of the Atlantic margins of north-western Europe is markedly affected by depressions, accompanied by strong or even violent winds and by precipitation which, though heaviest in winter and autumn, is abundant at all seasons. The frequency of winds from the warm waters of the Gulf Stream Drift results in the warmth of the winters and the marked equability of the climate.

The extent of the region thus affected by the westerlies at all seasons is great from south to north ; hence there are considerable differences, especially as regards temperature, between the areas bordering on the Mediterranean climatic region at the one end, and those beyond the Arctic Circle at the other. Contrast the figures given in the table on p. 26, for Santiago in Spain, for Valentia Island, and for Bodö just within the Arctic Circle on the Norwegian coast.

The region which may be termed oceanic is clearly limited inland by the Scandinavian Highlands in the north, and almost as clearly by the uplands of the Iberian Peninsula ; but between these extremes there is a more gradual transition towards central Europe. In the British Isles the English lowland is less equable and less rainy than the uplands of the west and north, and may be better classed with the region next treated.

The Mid-Temperate climate has rather warmer summers, and the winters are so much less influenced by the maritime influences that there is a period during which plant-growth is checked ; also the precipitation is not so heavy. Except in the winter the conditions of heat and water-supply are sufficiently favourable to allow a considerable variety in the forms of plant-life which can here develop.

The North Italian Plain may be grouped with the warmest part of the Mid-Temperate climatic region, for its temperature and rainfall conditions closely resemble those of the nearest part of this region, viz. the Rhône Valley just below Lyons. (Compare the figures for Milan and Lyons in the table on p. 26.)

The Interior Temperate climate shows a further reduction in

the effects of proximity to the ocean. Apart from the higher areas, on which the temperatures are necessarily lower, a line drawn southward from the peninsula of Jutland separates the regions south of the North Sea, where in the coldest month the mean temperature is above freezing-point, from those south of the Baltic Sea, where the winters have a cold period lasting one, two or three months. Also, the precipitation is lower, and has a maximum in summer.

Eastward, conditions gradually approach those of the sub-boreal and steppe climatic regions, and it is convenient to take as the eastward boundary the approximate limit of the beech, which, because of its need for a fairly long vegetative period, is often regarded as a criterion of temperate as distinct from continental conditions.

All the region here called "temperate" forms one of several in the world which are in middle latitudes and have rain at all seasons; hence its climate may be shortly labelled: "*mid-latitude, rainy.*"

The Mediterranean climate requires separate consideration for each season. In winter the temperature is almost everywhere above the limit of growth, and in the southern part it is definitely warm, while the rainfall is considerable; hence neither plant-growth nor the outdoor activities of man need cease. In spring there is everywhere warmth, and in most parts there is sufficient rainfall for the processes of plant-life, enabling flowering, fruiting and ripening to continue. In summer there is a period of three months or more of heat (above 68° F.), and the maximum may be very high; the rainfall becomes scanty or even fails, and with the high temperature this season is one of drought in which plant-growth ceases, except for deep-rooted types. In the autumn there is still warmth, and usually sufficient rainfall for a resumption of the growth of vegetation; indeed, in much of the European part of the region the autumn is the season of maximum precipitation.

It is convenient to summarize the more striking features of the Mediterranean type of climate as "winter warmth and summer drought," but, as in the case of the steppe type, no simple meteorological formula can adequately express its character. For this reason the limit of the growth of the olive, the most typical plant, is adopted as the northern boundary of the Mediterranean region save where, as in the interior of the

Iberian Peninsula, altitude modifies the climatic conditions and prevents the growth of this plant. (Compare the map showing the distribution of the olive in Fig. 18 with that of the climate regions.) It should be noted that, apart from the special case of the interior of the Iberian Peninsula (which will be discussed in a later chapter), the Mediterranean climate in Europe is rather closely restricted to the coast-lands of the Mediterranean Sea, together with the southern shores of the Crimean Peninsula.

Uplands and Highlands.—To simplify matters, it is lowland conditions which have been indicated in the text and in the map of climatic regions. In some parts, however, there are considerable complications, due to the lower temperatures and the greater precipitation which occur with higher altitudes. Such modifications will be taken into account in the more detailed regional studies which will follow, but here, and on the map in Fig. 15, attention can only be briefly drawn to the outstanding highland regions of the Alps and in Scandinavia. In several respects the latter highlands continue southward the characters of the Arctic climate, while conditions in the Alpine region are so complex that they must be specially described in a later chapter.

QUESTIONS

1. State the characteristics of the wind-belts which affect Europe. Explain how they influence different parts of the continent.

2. Draw a graph showing the annual "march of temperature" at any one place you name. Show (a) what deductions you can make from the graph, and (b) its incompleteness as a record of the temperatures.

3. For any one selected part of Europe, state and account for the essential characteristics of its rainfall.

4. Discuss whether it is possible to find and express definite limits to climatic regions.

5. Examine the truth of the statement that the critical element of climate in Europe is temperature in the north, and rainfall in the south.

6. "The Mediterranean climate has a mild winter and dry summer." Show in what ways this dictum is too simple.

7. Trace the normal succession of climatic conditions through the seasons in the steppe-lands of Europe.

8. Show by reference to one or more particular regions how the various elements of climate interact with one another.

9. To what extent can the climate of "Peninsular Europe" be regarded as a contrast to that of "Trunk Europe"?

CHAPTER III

VEGETATION, SOILS AND LAND- UTILIZATION

NATURAL VEGETATION

IN England and in other parts of Europe which have long been settled, the natural vegetation has been either greatly modified or entirely superseded by cultivated plants, but over other parts of the continent the natural vegetation still dominates the landscape and greatly influences mankind.

It assumes many forms, according to the climate, soil and other factors which determine its growth, but certain main types may be perceived ; we will consider each of these in turn, beginning with those of eastern Europe, where the contrasts are clearly displayed.

Tundra and Alpine Vegetation.—In the preceding chapter it was pointed out that trees cannot grow where the period of warmth is less than one month. The Arctic climate, therefore, with its cool and very short vegetative season, can support low woody shrubs only on the margin of the forest, and the characteristic vegetation of the tundra region consists of mosses and lichens, in addition to many kinds of small flowering and berry-bearing plants. On the drier parts of the tundra lichens grow together so as to form close mats ; in wetter situations mosses grow in abundance, and peat accumulates from dead vegetation and may form hillocks covered with living moss. Wet meadows occur, and swamps with cotton-grass and sedges occupy hollow places.

The region formed by the Scandinavian Highlands, known as the Fjeld, continues Arctic-like conditions southward, the change of latitude being largely offset by increasing altitude ; consequently, below the ice-fields of the highest parts, the mountain flora closely resembles that of the tundra, and may be considered as of the same type.

There are, however, considerable areas on the Scandinavian Highlands, where in the summer there is a thick growth of grasses and herbaceous plants, which afford a fairly rich pasture of the Alpine type. This pasture is so named from the

zone of the Alps situated above the tree-line but below that of perpetual snow; it is found also on other mountain regions—for example, on the Urals, Carpathians and Pyrenees.

It is impossible to show such a zonal arrangement of vegetation, varying according to altitude, on a small-scale map, and consequently only the type which occupies the greatest area has been indicated in Fig. 16. Thus, while the northern Urals and the Fjeld have been marked as belonging to the tundra and Alpine type, the other mountain regions have been shown as being mainly forested, but with Alpine pasture.

The Coniferous Forest.—Between the tundra and lowland forest is no sharp line of demarcation. Outposts of forest extend northwards into the tundra region, and patches of tundra vegetation are found within the limits of the forest. The dwarf birch which grows on the borders of the Arctic region is replaced by a larger kind farther south, while the spruce and pine increase southwards in number and size till they form the dominant trees in the great unbroken region of the coniferous forests.

In the eastern part of this region, extending into Siberia, the forest is known as the taiga; here Siberian species of spruce and pine are found, and fir and larch are subordinate members of the plant associations. In the west, the forest is composed of European species; the pine is that often known as Norway pine or Scots pine, and a zone of birch frequently forms the boundary towards the tundra or the fjeld. Throughout the coniferous forest, on the drier soils the pine predominates, and on the damper soils the spruce, while in the areas of poorest drainage moors with sphagnum moss are common.

Adaptation to the climate, with its short period of warmth, is shown by the needle-like form and leathery surface of the leaves. They are thus protected against the cold winds, and against the loss of moisture by transpiration at seasons when the water in the soil is frozen and there is therefore a time of "physiological drought." Yet the leaves do not fall in winter and are ready to take advantage of every spell of growing-weather; the forest, therefore, is evergreen. A store of food in the form of starch in the tissues of the wood is another adaptation to the climatic conditions, and the coniferous forests supply timber which is "soft," as compared with the "hard" woods of the deciduous forests.

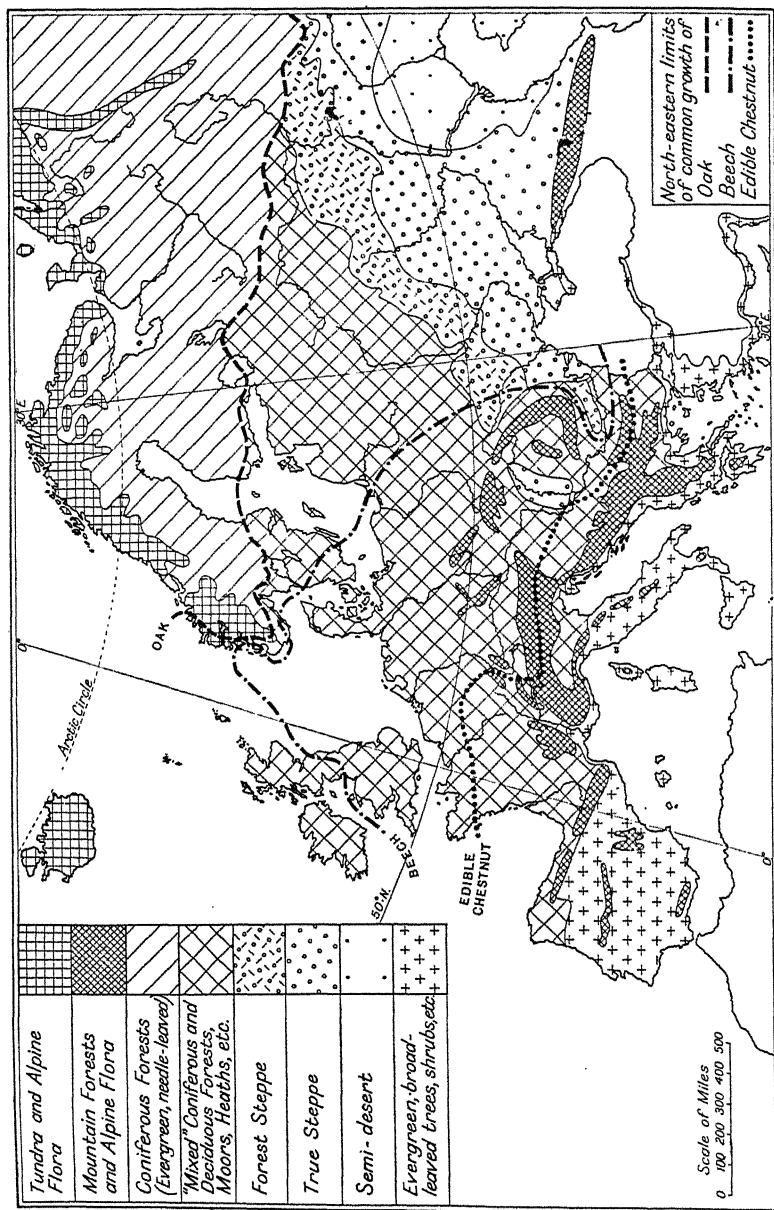


FIG. 16.—NATURAL VEGETATION REGIONS OF EUROPE.

The trees rise tall and straight, almost like poles, from a carpet of fallen needles, for there is little undergrowth in the coniferous forest. Factors which hinder the development of undergrowth are the lack of light beneath the high canopy of leafy branches, and the frequent freezing and thawing of the soil in spring and autumn, with the consequent injury to rootlets.

The "Mixed" Forest.—Even in the coniferous forests, there are representatives of the deciduous broad-leaved trees—for example, the birch, alder and poplar—and in more southerly regions these become more abundant, while others, such as the oak, appear and at last become common. Indeed, the occurrence of the oak is commonly taken as indicating the limit of the forests known as "mixed," and this criterion is here adopted on the map of natural vegetation. Yet the limits of even one species of tree cannot be accurately shown by a definite line, and those of the oak, beech, etc., shown on the map are necessary simplifications.

The annual leaf-fall of the deciduous trees is a protection against the cold and the consequent physiological drought of the winter, but this adaptation can occur only where the summer vegetative period is long enough, first for the growth of the new leaves, and then for their functioning. It appears that for this purpose it is necessary that the mean temperature should be above 42° F. for over five months.

The increasing length and warmth of the summers towards the south-west allow the growth of other species of trees which add to the variety, and in some cases to the value, of the deciduous forests. On the map in Fig. 16 this is illustrated by lines showing the approximate limits of the areas within which the beech and the edible chestnut are widely grown.

The varying nature of the mixed forests of coniferous and deciduous trees depends partly on the climate of the particular localities. In this respect, altitude, with the accompanying modifications of temperature and precipitation, is the main factor in causing the uplands and highlands to have forests of distinctive character; in central Europe the lower slopes are largely covered with deciduous trees and the upper with conifers, until the limit of forest growth is reached. Soil conditions as well as relief affect the character of the natural vegetation, and upland heaths and moors and lowland fens occupy considerable areas.

Over the greater part of the mixed forest region man has modified or transformed the original tree-cover. This has been done either intentionally, by cutting down the trees for timber or to clear the ground for agriculture, or unintentionally by fire or by allowing the young shoots to be eaten by goats and other animals. Once destroyed, forests may be gradually replaced by a natural extension from neighbouring regions; more commonly, however, new species are deliberately planted, in some parts forming woods of particular broad-leaved trees, and in other parts woods of conifers. In the main, however, cleared forest land has been utilized for agriculture or pasture.

On its southern margin, a climatic limit is set to the deciduous forest by an interruption of the period of summer growth. In the south-west and south this interruption is caused by the summer drought of the Mediterranean region, though the greater precipitation on the higher lands of that region allows trees to extend along the mountains far into the southern peninsulas of Europe.

In the south-east of the continent the hot and dry summer prevents tree growth in general, though there are tongues of forest stretching down the river valleys and "islands" of woodland or scattered trees in the damper places beyond the general limit. Indeed, the transition is so gradual that the northern belt of the steppe region is often known as the forest-steppe.

The Steppe Vegetation.—South-east of this transitional belt is the extensive region of the true steppes in which grasses and herbaceous plants, either annual or biennial, form the characteristic vegetation. As stated in the preceding chapter, the spring is the main season of plant activity; the grasses and herbs appear above ground, grow rapidly, flower and produce their seeds in the short period between the winter cold and the drought of midsummer. Then they die down, and life is hidden beneath the surface, where, in tubers, bulbs, etc., a store of food is formed and preserved in readiness for the next season. A second short and less pronounced period of plant activity occurs in the autumn, but for most of the year until the next spring the ground appears bare.

According to differences of climate and soil within the steppe region, there are differences in the kinds, and the abundance, of the plant-forms. In the better-watered, northern and western parts of the true steppe there are areas of "meadow

steppe," of tall tufted grasses and gay flowering plants such as campanula and clover, which make a continuous thick cover to the ground ; even in a natural state, this can be mown to obtain a rich harvest of hay for use in the dry and cold seasons. In the less-watered districts, less succulent grasses and herbs which grow closer to the ground and are rather sparsely scattered form the greater part of the vegetation ; this can be utilized for grazing rather than for the cutting of hay.

As in the case of the more fertile forest regions, so here on the steppes the more productive areas have been much changed by man, both by pastoralists mowing or grazing the natural growths, and by agriculturalists cultivating the land for crops.

The Semi-desert Vegetation.—In the poorer steppe lands there appear some shrubs which have deep and long roots to obtain as much water as possible, and whitish, felted leaves from which the moisture is but slowly transpired ; there are also plants which are protected against the wind and the resultant loss of moisture by growing close to the surface of the ground. In the semi-desert, such forms of life adapted to an arid climate represent an increasing proportion of the vegetation as the grasses and herbaceous plants become fewer ; the amount of vegetation of any kind is but small and the bare soil is everywhere visible. As protection against still greater aridity, the woody growths commonly have their leaves reduced to spines. Also, as the conditions approach those of the deserts in which there are only occasional rains, the annual plants remain dormant below the surface for longer periods ; but whenever in the summer the soil receives a supply of water, they may appear, and pass rapidly through their very short vegetative period.

In the small areas in the extreme south-east which may properly be called desert, the vegetation is very scanty indeed, and only the "halophytes" adapted to living in salty soils, or plants which can find sufficient moisture in the sand-dunes, can exist.

The "Mediterranean" Vegetation.—As the winter temperatures are generally above the limit of growth, trees and woody shrubs which live throughout the year are the characteristic plant-forms ; they are protected against the loss of water in the dry summer by various devices, including deep and wide root development, a thick, rough bark, such as cork, and leaves of a different kind from those of the more northerly forest trees.

As the winter allows growth, there is no common period of leaf-

fall, nor need there be the extreme adaptation of a reduction of the leaves to needle-form ; the trees are evergreen and the leaves are broad, but their glossy and hard surface prevents rapid transpiration. The evergreen oak, cork oak, olive, holly, laurel and myrtle are of this kind and are typical of the region, although some of them may grow also in the south-western parts of the deciduous forest region where the winters are sufficiently warm.

Yet these broad-leaved evergreen trees are not the only plants which can live under Mediterranean conditions, and an important group consists of low shrubs : e.g. heaths which are evergreen but have small and narrow leaves ; thyme, lavender and other aromatic shrubs ; the brightly flowering cistus, and many others.

Originally the Mediterranean region was largely forested, but these forests have almost disappeared ; now the natural vegetation, in the sense of that not deliberately planted by man, is only exceptionally forest or woodland, and that is found mainly on mountains or uplands where the temperatures are lower and the rainfall is greater than is normal. In such situations there are woods of evergreen oak or cork oak, as in the Iberian Peninsula, and there are also areas where the trees are those which are more common in other vegetation regions, such as the beech and edible chestnut, which extend southwards along the mountains of Italy, or the pines which grow on the uplands of the Balkan Peninsula.

Much more extensive are the thickets of evergreen shrubs which have replaced most of the original forests ; these growths may include low trees, such as the laurel and myrtle, and bushy plants, such as tree-heaths, cistus, broom and juniper. Such thickets are known as *maquis* in France, *macchia* in Italy and *monte bajo* in Spain.

Still poorer growths of lower bushes are formed of thyme, sage, lavender, small heaths, etc., with thistles and various flowering herbs, such as the asphodel and iris. These associations show bare earth between the plants ; they are widely developed on the drier soils and are known as *garrigues* in France, *tomillares* in Spain and *phrygana* in Greece.

Meadows of the north-western European type are rare ; in well-watered situations there are associations of grasses and bulbous plants which give pasture, but these commonly dry up in the summer.

On the other hand, in very dry areas, such as the interior plateaus and the south-eastern lowlands of Spain, the climatic conditions and the vegetation approach those of the steppes of eastern Europe ; here grasses may predominate, and esparto grass is still the vegetation cover of some districts in Spain.

The natural or semi-natural vegetation is now found mainly on the higher parts, the steeper slopes and the poorer soils of the Mediterranean region ; most of the lowland and much of the hill-country has been taken in for cultivation.

SOILS

It might be expected that the nature of the soil is largely determined by the geological factor—the rock from which it is derived, for in England differences between soils often correspond to differences of the parent material. This view was generally held until Russian scientists, studying the soils of their vast country, which has such contrasted climates, realized that the climatic conditions are the main cause of the striking contrasts in the soils. To appreciate this, as well as to understand the essential character of the soils and their relation to agriculture, we may examine in turn the main soil types and soil regions of Europe, beginning with those of eastern Europe.

The Podsoles.—Beneath a thin superficial layer formed of fibrous vegetable material, the podsoles have an upper level, or “horizon,” of an ashen-grey colour from which they were named (Russian : pod = under, zola = ash). This upper horizon has a loose structure, and consists of sandy and gravelly material. Both colour and structure are due to the washing down, or leaching, of the soluble salts, the lime constituent (calcium carbonate) and the clay from the uppermost to the second horizon, situated a foot or more beneath the surface. This second horizon, because of the materials washed into it, is usually compact, and often contains a layer cemented together by iron into an impermeable “pan.” The essential process of leaching is the consequence of the downward drainage of water, and this occurs when the precipitation exceeds the combined loss by evaporation, the surface run-off and the transpiration of water by plants.

Hence climate is the main control of the development of the podsoles, and, moreover, the degree to which soils are leached is, directly and indirectly, due to the climate. The map in Fig. 17

shows the distribution of two types, the strongly leached and the moderately leached. The former extends widely over north-eastern Europe (excluding the tundra and mountain areas, which will be considered later), where the summer warmth is not enough to cause great evaporation. Also, the climate has here an indirect effect, since it allows the growth only of the coniferous forest, of which the vegetable residues tend to accumulate as a peaty layer, giving almost permanently wet conditions. The abundantly watered western side of Scandinavia also has soils of the same type. Farther south the coast-lands around the south-eastern corner of the North Sea have similar conditions, for the predominantly sandy character of the subsoil allows easy downward movement of the rain-water.

Soil conditions react upon the vegetation ; for example, the northern limit of the oak is partly determined by climate and partly by the difficulty with which this tree grows on the more strongly leached podsoles. Moreover, these strongly leached podsoles, having lost much of their plant-food constituents from the upper horizon, are unfavourable for cultivation ; to be productive, they need to be supplied with a considerable amount of lime and other manures and to be very thoroughly tilled.

The moderately leached podsoles are found in warmer well-watered regions, and in these the less-marked grey colour of the upper soil and the usual absence of a compact and cemented lower horizon bear witness to the retention of more of the plant-foods in a condition available for plant-life. The deciduous forests, too, supply an annual leaf-fall which is incorporated with the soil.

The map shows that the moderately leached podsoles extend over the deciduous forest regions of eastern Europe and over much of the north-western coast-lands of the continent, excepting the mountain areas ; they are also found on interior uplands. As there are no definite limits to climatic conditions and seldom sharp changes in the vegetation, so the resultant soil types usually merge into one another.

In areas of abundant water together with poor drainage, the podsol regions are characterized by the development of peaty soils. Moorland peats form acid soils of little value to man, but since the fen peats found in lower situations form less acid soils and contain more plant-food, they may prove productive when drained.

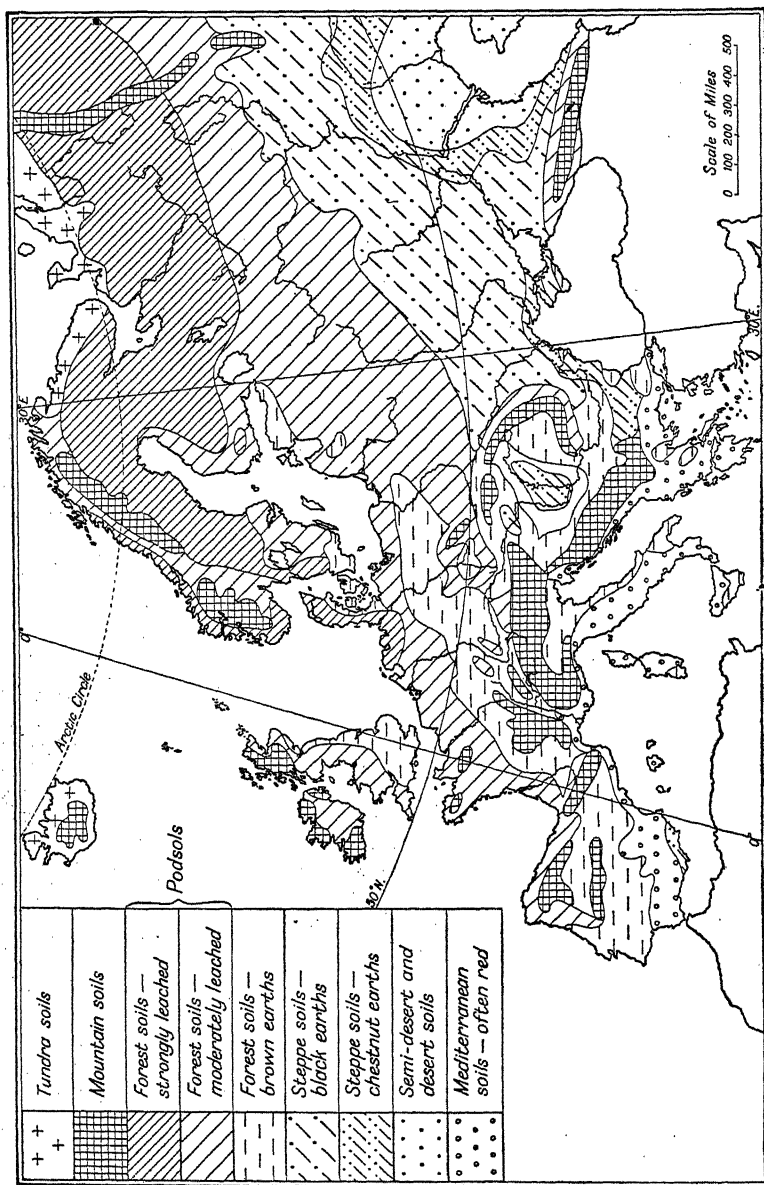


FIG. 17.—SOIL REGIONS OF EUROPE.

The Tundra Soils.—These soils of the far north are largely the result of their water-logged condition and the low temperatures. Evaporation is very slight and the subsoil is permanently frozen below a depth of 2 or 3 feet. Humus, the partially decomposed organic matter formed from plant residues, remains as a surface layer, for downward leaching is impossible, and the low temperatures hinder chemical or other changes; peat is commonly formed.

It thus appears that an abundance or an excess of water is the main factor in determining the soil conditions in all the northern part of eastern Europe. In the south-eastern part, on the contrary, seasonal or permanent aridity is the controlling factor.

The Black Earths are the characteristic soils of most of the steppe areas, where they are known as chernozem. The black colour is due to a large proportion of humus in the upper horizon, which is usually about 3 feet in depth, and at the base of this there is an accumulation of calcium carbonate, before a transition to the parent material. This parent material is often, but not always, loess.

The humus is derived from the annual addition of vegetable matter from the grasses and herbaceous plants; the decomposition remains incomplete, because it depends upon the activity of bacteria and other soil-organisms, which is limited, like that of the vegetation, by winter cold and summer drought.

Of great importance is the occurrence of rains and the melting of snow in spring followed in summer by heat and drought. In spring the calcium carbonate is washed down from the surface; in summer the surface soil becomes dry, and by capillarity the water rises from below and brings up soluble matter, including calcium carbonate, which is then deposited as the water evaporates. There is thus an accumulation of the calcium carbonate at the base of the upper horizon—an indication of a balance in this black earth region between the downward leaching of the well-watered north and the upward movement which becomes most important in the arid south-east.

In the black earths there is an abundance of plant food, and cultivation is made easy by the crumbly structure of the humus-bearing layer; consequently the black earths stand among the best of the world's soils from the point of view of fertility.

The Chestnut-coloured Soils.—On the northern side the

black earths pass through grades of greyness to the ashy soils of the forest regions ; on the south-eastern side they change to a light-brown, chestnut colour, since the dark humus decreases in amount as the plant-life from which it is derived becomes more scanty. Because of the increasing aridity there is still less leaching than in the black earths, and there is more calcium carbonate in the upper horizon. In themselves, these soils are nearly as valuable as the black earths, but the climate is not so propitious to agriculture.

It should be noted that the steppe soils, besides covering most of south-eastern Europe, are found in the middle Danubian lowlands and in other areas of central Europe too small to be shown on the map.

The Semi-desert and Desert Soils.—The marked aridity in the Caspian Depression continues the change just described, and the upper horizons of the soils progressively contain less humus and more calcium carbonate. Their colour changes through brown to grey, and their fertility decreases. In the most desert-like areas, blown sand is accumulated and even heaped up in dunes. Also, in some parts there appear upon the surface thin crusts, or efflorescences. These are formed by water from the occasional rains sinking some distance into the soil, which then again dries ; the water, after a period during which it dissolves the salts in the soil, works upward by capillarity and evaporates on the surface, where it leaves saline or alkaline deposits.

In these arid regions soil conditions combine with climate to make them inhospitable to man.

Brown Forest Earths.—From the point of view of the formation of productive soils, northern Russia suffers from an excess, and southern Russia from a deficit, of water ; the best balance occurs in the central Russian regions. A similar balance as regards the water-supply occurs in much of central and western Europe, and here it is associated with less severe temperature conditions than in the eastern part of the continent.

Consequently in these regions there is less leaching than in the case of the podsoles, while a greater activity of the soil organisms reduces the amount of humus as compared with that of the black earths. With a natural vegetation of deciduous forest, there is an annual leaf-fall which increases the value of

the soils for cultivation, and their generally crumbly structure aids tillage.

This group of soils is a large one, and there are many differences in the colour and the other conditions, partly because with this "balanced" type of climate differences in the nature of the parent rock show themselves in the soils, as is well illustrated in the case of south-eastern England.

Moreover, since these soils are generally quite remunerative and have been worked by farmers for centuries, they have often been transformed from a natural to an artificial state.

Mediterranean Soils.—These are varied in character, but frequently have a reddish colour, and although they are often derived from limestone, they are typically fairly heavy clays; unfortunately soil science has not advanced far enough to reach an unquestioned explanation of their mode of origin. In several parts of the Mediterranean lands the red clays provide "oases" of cultivable land in otherwise almost barren limestone areas.

Mountain Soils.—Because of the low temperatures the weathering of the soils of mountain regions has been largely physical, and their development has not in general proceeded far. In the soils of areas above the forest limit there may be a humus layer, recalling that of the tundra, and below this a tendency to a podsol character shows itself. On the slopes there is usually only a thin covering of coarse rock fragments, while the finer material may be deposited as a deeper, and sometimes fertile, soil in the valleys.

LAND-USE AND CULTIVATION

The use that men make of the land depends partly on their desire for particular necessities and comforts, partly on their knowledge and equipment for obtaining these, and partly on natural conditions of climate, vegetation and soil.

Hence the map showing the main forms of land-use (see Fig. 18) shows certain broad similarities with the maps showing the climatic regions, the natural vegetation and the soil types.

Like those maps, that of land-use regions has had to be generalized, and the respective forms of utilization overlap considerably, but the following regions can be distinguished.

The "Mainly Unutilized" Areas.—In the cold north there are the tundra lands which offer practically nothing except a little pasturage for reindeer, the northern Urals and the parts of

the Scandinavian Mountains to which at best cattle may be driven for a few weeks in the year, and the greater part of Iceland, in which there are some areas of summer feeding for sheep. In the arid south-east of Europe there are only poor exclaves of the steppe-lands and small areas where irrigation is possible.

Dominant Forest areas are those of the coniferous forests in the broad belt of country forming the northern portions of Sweden, Finland and Russia. They are still mainly unbroken, although there are occasional clearings in which some agriculture and pastoral work are carried on. In the extreme north only vegetables can be grown, but in the remaining area barley, the grain crop which can ripen in the shortest vegetative period, is cultivated. It should be noted that this grain is the "six-row" barley which is used for man's food; it is an entirely different plant from the much more productive "two-row" barley which is grown in England mainly for malt, and in the south-west Baltic lands also as food for pigs. Farther south there are many "islands" of uncleared forest in the region marked on the map as dominant crop-land; two of these are diagrammatically shown, one being the lake-studded area where Latvia, Lithuania and Russia adjoin, and the other the great Pripet Marshes.

Mountain Forest and Pasture.—These regions are the uplands and highlands of Central Europe and the Caucasus Mountains. In general, they are characterized by having deciduous forest with coniferous forest at higher levels, and then alpine pastures, and in some cases these are succeeded by culminating areas of bare rock and perpetual snow; only in the valleys is cultivation possible. The use of the land varies from region to region, as will be explained in more detail in later chapters.

Dominant Pasture areas are those in which the main occupation of the people is the keeping of animals and in which a high proportion of the land is used for growing hay or for grazing, although there may be some crops grown either for fodder or for human use, and there may also be forests, moors or heaths. These largely pastoral areas fall into three main groups:

(i) Over much of north-western Europe, including the southern coast of Iceland, the climate is too wet for grain growing to be the most remunerative form of farming. In

Iceland sheep are reared ; in Britain both sheep and cattle are kept ; in Norway, and in parts of the North Sea Lowlands, the keeping of cattle and the production of milk, butter and cheese are the main objects of farming. Grasses, clover and root crops are therefore grown and, as food for men, potatoes and oats—a grain which can ripen in relatively cool and wet summers.

(ii) In the Mediterranean region poor pasture has to a considerable extent superseded the forests of the uplands, while in parts woods of evergreen oak yield acorns as mast for animals. Not all the upland areas are used for pasture, however, for there are woods of cork oak, as well as of chestnut and other trees which yield their fruit. Sheep and goats are the animals most commonly kept, and in the Balkan Peninsula swine, too, are numerous. In the northern uplands of this peninsula, where the climate is not of the Mediterranean type, the forests have been so largely cut that even here pastoral work is now dominant ; cattle are relatively more important in these Balkan regions than in the other two southern peninsulas of Europe.

(iii) In the steppe-lands of south-eastern Europe the growing of crops gradually becomes less, and the work of the people becomes more restricted to the keeping of animals, towards the south-east. Cattle are reared in the rather better-watered part of the predominantly pastoral area around the Sea of Azov, and sheep mainly on the still drier country draining to the Caspian Sea.

Dominant Crop-land areas form the largest, as well as the most productive, group of agricultural regions of Europe. They are very varied in type, and one useful way of distinguishing them is according to the grain which is most commonly grown, although almost everywhere the keeping of animals is one aim of the farming, and generally vegetables are a product of considerable importance.

Grain Crops.—*Oats*, as stated above, form the characteristic crop over much of the pasture-lands of the north-west, and the crop-land in which they are predominant extends over southern Scandinavia to the lands north of the Gulf of Finland. Yet other grains, as well as root crops, are grown in the same area, and the two-rowed barley is particularly important in the region around the entry to the Baltic Sea. In eastern England, too, barley is largely grown, and here it rivals wheat as regards the amount of land devoted to it.

Rye.—The rye belt stretches from central Europe south of the North Sea and Baltic Sea across the middle of Russia as far as the Ural Mountains. Although rye requires a longer vegetative period than barley, and drier conditions for ripening than oats, it is a hardy grain and is largely grown on the inhospitable podsoles of Russia and the glaciated areas of Germany and Poland. Rye bread has now been displaced by wheaten bread in western Europe, but it is still largely used in central Europe, and remains the staple food in the east. In Russia buckwheat and oats are also grown in the region in which rye is dominant.

Wheat.—The wheat zone is the most extensive, for its northern margin forms a great curve stretching from eastern England into central Europe and across Russia south of the rye belt, while it is largely grown in the warmer parts of central Europe and in the Mediterranean region. Thus wheat overlaps with barley in England, with rye in the Rhine-lands and in the black-earth areas of Russia, and with maize in the southern part of central and western Europe. Comparing the map of crop distributions in Fig. 18 with that of the duration of warmth in Fig. 11, it will be noticed that the northern part of the rye belt has a warm period lasting about four months, that of the wheat belt about five months and that of the maize belt over six months.

Yet the climatic conditions are, of course, by no means uniform over the whole range of wheat production of Europe, and the methods of cultivation consequently vary. In the west "winter wheat" is cultivated; that is to say, the grain is sown in autumn, remains dormant during the winter, grows as soon as the vegetative period begins in spring and is harvested in late summer. In the east the winters are too severe for this type of wheat, and "spring wheat" takes its place; though it is not sown until well in the spring, the hot summers allow a rapid growth and the harvest occurs rather late. In the Mediterranean region the wheat is sown in autumn, slowly continues its growth during the winter and ripens in the dry weather of the early summer.

On the map showing the crops, wheat is marked as the "characteristic" grain of certain regions, either with or without others indicated on this map, but it is almost always only one of several crops grown in rotation in successive years.

Maize.—In its climatic requirements this is the most exacting of the common grain crops of Europe, for it requires both con-

siderable heat and also a good supply of moisture ; hence it is grown in the parts of temperate Europe which have the warmest summers, but not commonly in the Mediterranean region nor in the eastern part of the steppe-lands, where there is a lack of rain in summer.

Barley.—Barley, and particularly the six-rowed varieties, can mature with little heat and with little moisture. Accordingly, barley is the marginal crop, not only in the cold north, but also in the dry south-east ; here and in the neighbouring parts of Asia it is the grain grown by the semi-nomadic peoples in the areas dividing “ the desert ” from “ the sown.”

Other Crops.—Space does not permit a separate comment on the distribution of all the other crops. Some are grown as food for men or animals, including grains such as rice, buck-wheat and millet, potatoes, root crops, and vegetables of many other kinds. Other are “ industrial ” crops from which other products are obtained ; e.g. sugar-beet, flax and tobacco. Among these, the sugar-beet is largely grown over an area which almost coincides with the northern part of the wheat belt, that is, from eastern England across the north of France into Belgium and Germany, and thence across Poland and Czechoslovakia into the black-earth region of Russia. Flax is another important industrial plant, from which the fibre is used for manufacturing linen and the seed is crushed for oil and cattle-food. It has a fairly wide climatic range and is cultivated in districts as far apart as northern Ireland, and northern and southern Russia.

Fruits.—The northern part of the area shown as crop-land can allow the growth only of the more hardy kinds of fruit, notably apples and cherries ; in the central part appear others, such as pears and plums ; in the south there is an increasingly great variety. The northern limits of three fruits of considerable importance are drawn on the map. The vine is very widely cultivated, and the wine made from it is used both as a common drink in many of the vine-growing countries and for export as a luxury in cooler lands. It is significant that although the greatest amount of wine is produced in the Mediterranean region or on its margins, some of the most valuable kinds are obtained from near the northern limit of the vine, e.g. in Champagne in France and by the middle Rhine and its tributaries in Germany.

The olive, the most characteristic tree of lands with the Mediterranean type of climate, yields oil which is locally used to supply fat in the diet as butter is utilized in the cooler cattle-rearing countries. Citrus fruits, mainly oranges and lemons, need higher temperatures for ripening than generally occur in the northern part of the Mediterranean region; therefore, although their limit is shown on the map to approach this margin in the Riviera district of the Gulf of Genoa, the yield here is neither so good nor so great as farther south. Indeed, the distribution of the citrus fruits indicates fairly well the extent of a "very warm," as distinct from a "warm," variety of the Mediterranean climate. As in the case of the other fruits of southern Europe, the oranges and lemons are grown partly for local use and partly for export, particularly to central and north-western Europe.

Besides citrus fruits, olives and grapes, many other fruits are cultivated in the Mediterranean region, e.g. apricots, peaches and edible nuts, such as almonds and walnuts.

So important is fruit growing, and so much of the work of the people is directly or indirectly bound up with it, that the area of the Mediterranean climate may almost be labelled as the fruit-growing region of Europe.

QUESTIONS

1. Describe the *transitions* between tundra, forest, steppe and desert in Russia.

2. Show how the natural vegetation is adapted to the climatic conditions of the "Mediterranean" region.

3. Give a description of the typical "black earth" of Russia, and account for its characteristics.

4. Distinguish between the various types of pastoral work in Europe, and give reasons for the differences.

5. To what extent, and in what ways, is the cultivation of wheat related to climatic conditions.

6. Explain how the differences between types of forest found in Europe are related to climatic differences.

7. Describe the nature and distribution of the podsolis of Europe, and show how they are interrelated with both climate and natural vegetation.

8. Discuss the truth of the statement: "Natural vegetation regions are also regions of characteristic types of farming."

beyond the limits of this continent ; the map in Fig. 75 should be studied to see the relation between Europe and the other continents in this respect.

The Arctic Region.—The Arctic Region is primarily characterized by its cold climate, which has already been described, and it is to be noted that the region is considered as including both the tundra lands within the Arctic Circle and also the higher areas of the Scandinavian Highlands. When the minor regions of Arctic Europe are studied separately, the differences between these two parts must be taken into account. It may here be pointed out that the common climatic conditions of extremely long, cold and dark winters, with very short and cool summers, in both parts of the Arctic Region have resulted in similar conditions as regards the soil, which is wet in summer on the surface, but below this is permanently frozen. Consequently the natural vegetation is mainly of small growths, such as mosses, lichens and low shrubs, and man has been able to make little use of the region.

To the southern part of the Scandinavian Highlands cattle are driven in summer from the neighbouring lowland areas of Norway, while the northern part of these uplands and the tundra region are traversed by reindeer, which seek as food the sparse pastures of "reindeer moss," growing so slowly that it needs several years to form a fresh pasture after it has been cropped by a herd. The people who own the reindeer are necessarily nomadic and few in number ; they retire in winter to the forest, where hunting is possible, and in summer advance to the coast, where fishing adds to their scanty resources. Since this region offers little which can be exchanged for the products of other regions, and since its position is so remote and the means of communication are so poor, there is very little contact with the rest of Europe, and the inhabitants live in a relatively primitive manner.

The Boreal or Sub-Arctic Forest.—This region has a Boreal or Sub-Arctic climate and a vegetation cover of coniferous forest ; the soils have been in general strongly leached and the surface is often swampy. Largely because of the unfavourable physical conditions, only small clearings have been made in the forests. This is most markedly the case in the east, where the winters are coldest and longest, and where the rivers, which offer the easiest routes, drain to the Arctic Sea. During

the winter the snow accumulates on the land, but with the rapid rise in temperature in spring it melts and floods the country ; in this region the thaw occurs in the southern part while the lower courses of the northward-flowing rivers are still ice-bound. The inundations are therefore serious, and work on the land and traffic on the rivers are both delayed ; the effective period of activity in summer is thus curtailed, and agriculture, pastoral work and trade are further handicapped.

In the north vegetables are the main crop ; in the south barley is grown, and some oats and rye ; some cattle, sheep and horses are reared, but the amount of farming is very small in relation to the great extent of the region. The maps in Figs. 18 and 19 show that only along parts of the southern margin have crop-lands extended into the Boreal Forest region.

In the main, forestry is still the characteristic occupation, and even this is largely limited to the southern part and to the neighbourhood of the rivers. Another resource is the hunting and trapping of the fur-bearing animals, though these have now been much reduced in numbers. With the exception of some towns situated on the rivers, and mostly either by the northern seas or near the southern margin, the settlements are small and widely scattered, and the population is scanty.

On the eastern margin of the region in Europe, the Hercynian block of the Urals yields mineral ores which have made possible industrial development.

The western part of the Boreal Forest region, in Finland and Sweden, is made more accessible by the existence of the Gulf of Bothnia, towards which the rivers drain ; here there has been more development in connexion with all the resources of the lands and the waters. This is especially the case at the mouths of the rivers and around the coasts of the Gulf of Bothnia, where agriculture and pastoral work gain from some amelioration of the climate, and where the timber from the forests is worked up in saw mills and factories run by water-power from the streams. Moreover, in this western area the ancient rocks of the Baltic Shield emerge from below the sedimentary deposits of the Russian Platform ; some minerals are obtained, and by the Gulf of Bothnia a little iron-working utilizes ore from inland mines. The population following these occupations is therefore more considerable in this narrow coastal belt than elsewhere in the Boreal Forest region.

Sub-boreal or Mid-Latitude Farmed Forest.—The better conditions of the Sub-boreal climate region are reflected in the “mixed” character of the natural vegetation and the less thorough leaching of the soils. To these conditions is added greater accessibility from central Europe, whence came the greater developments in regard to the use of the land. Consequently the clearings have been more extensive than farther north, and now the region may be conveniently labelled “farmed

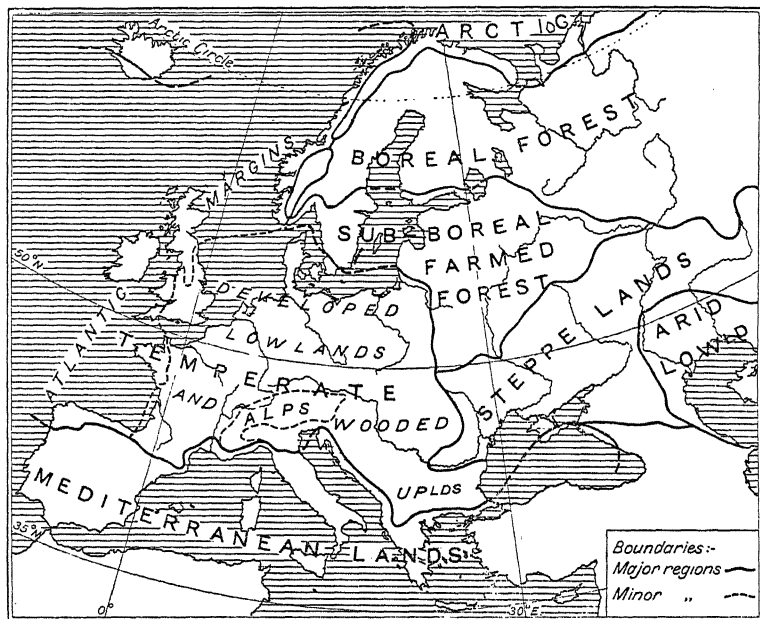


FIG. 19.—GEOGRAPHICAL REGIONS OF EUROPE.

forest.” There are considerable areas of still virgin forest where timber is cut for export, but most of the region may be regarded as crop-land, oats and rye being the chief grain crops.

In the Baltic Shield area in Sweden there has been a development of mining and manufacturing, and around the shores of the Baltic Sea there have grown up a number of towns and cities dependent upon the agricultural and industrial occupations and the associated commerce. In the Russian area are the past and present capitals, Leningrad and Moscow, while industries and trade have grown up at a number of other large centres.

Yet in general the Sub-boreal Farmed Forest region is predominantly agricultural, and it is one of the less densely populated regions of the continent, with the exception of the Tundra, the Boreal Forest and the arid Caspian depression. The map of the geographical regions should be compared with that facing p. 1, showing the density of population in Europe.

Steppe or Grain-and-Grazing Lands.—These offer more to agriculture than the forests situated north of them, because of their easier working and the greater fertility of their soils, especially in the belt of the black earth. The climate, too, is more favourable, with its longer summers and the higher temperatures in the growing season, except where the supply of water is scanty, as on the south-eastern margin. Although agriculture has only relatively recently superseded a primitive form of pastoral work, and although modern scientific methods of cultivation have still more recently been introduced, nevertheless this region has a wide range of products and is capable of giving high yields. This is particularly true in the western part of the steppe-lands, where the more valuable grains, maize and wheat, are grown in great amount, together with beet, flax and other industrial crops, and where the vine and other fruit trees are cultivated.

Towards the east the variety of products is reduced by the more extreme temperatures and the poorer supply of water; also the normal yield of the crops is less, and the keeping of animals is relatively more important than in the west. Moreover, the rainfall is more variable in the eastern steppe-lands and failure of the harvests is a serious menace. For these reasons, the population dependent upon agriculture is considerable in the west, but decreases greatly towards the east.

Mineral resources are associated with the two areas where the older rocks come to the surface in southern Russia. Within the eastward bend of the Dnieper the ancient rocks yield ores of iron and manganese, and where the river cuts through the resistant outcrop the rapids give enormous water-power, which is used for the production of electricity. In the Hercynian block of the Donetz region is a large coalfield which has also led to the growth of industries in southern Russia. There are oilfields on the margins of the Carpathians in the south-west, and of the Caucasus in the south-east, of the steppe-lands.

In spite of various drawbacks to navigation, the rivers, as

well as roads and railways, carry traffic through the steppe-lands between the Black Sea and the interior of Russia and Rumania.

With these varied resources and activities, the western part of the steppe-lands has much urban as well as rural development, and the density of population is greater than in any other part of eastern Europe. Indeed, the manner of life of the people is becoming similar to that of the central countries of the continent.

At its south-eastern margin, the region adjoins the Caucasus Mountains, which are geographically more closely related to the highlands of south-western Asia than to the neighbouring regions of Europe.

The Arid Caspian Lowland.—The low and irregular rainfall, the infertility of the soils, the lack of other resources and the remoteness of the position combine to make this extreme south-east of Europe a region of difficulty to man, and comparable in this respect with the extreme north-east of the continent. The lower valley of the Volga, with its port, Astrakhan, is the main exception to this rule.

The Mediterranean Lands.—To its position on the globe this region owes both its general climatic conditions of a mild, moist winter and a hot, dry summer, and also its general structural characteristics of fold-mountains enclosing sea-filled subsidence basins, as a result of which there are commonly narrow coastal lowlands rising rather steeply to hills or mountain ranges.

In the eastern part of the Mediterranean lands of Europe the climate tends to dryness and there is relatively little lowland; here the growing of the characteristic fruits is one of the main occupations of the people, who have terraced the lower slopes for this purpose, while at higher levels there is little more than poor pasturage.

Around the western basin of the Mediterranean Sea and by the Atlantic coast in the same latitude, there is generally a better rainfall or better possibilities of irrigation, while there is also a greater area of lowland. Consequently there is a wider range of products, and grain and vegetables, in addition to fruits, are grown to a considerable extent.

The interior of the Iberian Peninsula is largely plateau, and while some higher ranges are well watered and bear a vegetation cover of woodland, much of the remainder tends to aridity

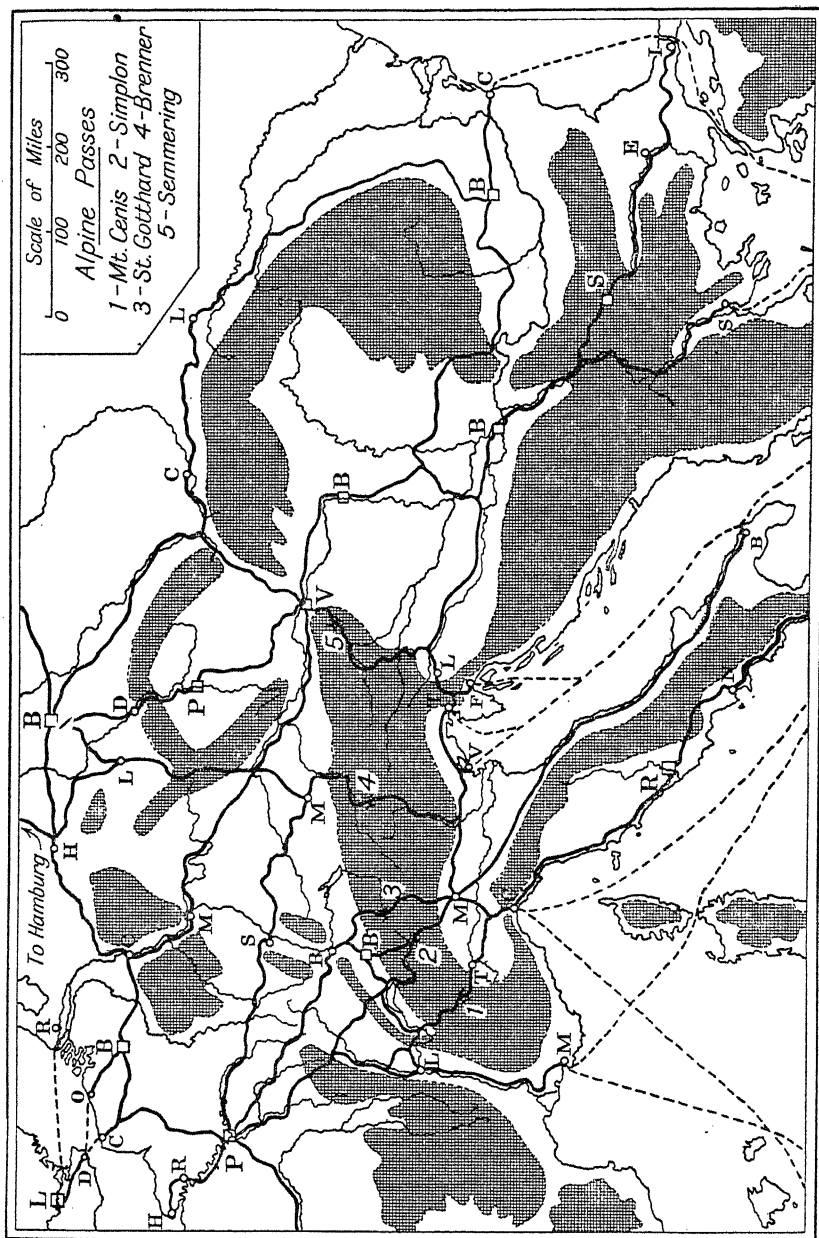


Fig. 20.—RAILWAY ROUTES AND COMMERCIAL CENTRES.

and is dependent upon an artificial water-supply for its utilization.

Coal deposits are lacking, and only in scattered areas are there other forms of mineral wealth, and in the Mediterranean region industrial development is mainly limited to certain ports at or near river-mouths.

The Mediterranean Sea and its extensions, the Adriatic, Aegean and Black Seas, give access from the ocean to a great part of southern Europe, and with the cutting of the Suez Canal the Mediterranean Sea links Europe with the Indian Ocean and the Far East. But the mountain-folds encircling the sea impede communications between the Mediterranean lands and those of the remaining part of the continent, and land traffic is restricted to a few breaks or passes in the mountain barriers; hence in a few ports on the northern shores is concentrated a considerable amount of commerce, both in local products and in goods of wider origin. (The situation of the chief ports and their relation to the routes leading to central and north-western Europe is shown in the map in Fig. 20.) Trading is therefore important in certain parts of the Mediterranean region, and this occupation and the intensive agriculture and horticulture of the larger coastal lowlands have together given rise to some great cities and some areas of dense population.

Temperate Europe.—The climate of this region has enabled much of it to be so thoroughly cultivated for certain crops over large areas that when compared with other parts of the world it might be called one of the great mid-latitude croplands; indeed the adjoining well-watered part of the Steppe lands now produces so much grain that it might be joined with Temperate Europe to form one of the major regions of the world. Together they might be termed the *European Mid-Latitude Cropland*.

Temperate Europe, however, has within it such a variety of relief and structure that it contains different minor regions; no single descriptive label, such as "lowland" or "forest," would be applicable to it as a whole. It is, therefore, convenient to term it simply "Temperate Europe." The differences within it are so marked that it is necessary to divide it into three minor regions, as shown on the maps in Figs. 19 and 21, and these minor regions will now be separately considered.

The Atlantic Margins.—The characteristic feature of the

climate of Temperate Europe is the influence of oceanic winds during the whole year. This influence is particularly marked along the Atlantic Margins from the north of the Iberian Peninsula to the northernmost part of the continent, and throughout this extent it produces a very equable and rainy climate.

Also, along this marginal belt, the earth's crust has suffered dislocations which have resulted in the drowning of large areas and the upraising of most of the remainder, and hence the lands have a considerable elevation. Their altitude combines with the rainy character of the climate and the associated leaching of the soils to handicap agriculture. Forests, moors and heaths cover the highland and upland areas, and the relatively small areas of lowland are mainly given over to grass; with the rather higher temperatures of the southern part, however, there is more cultivation.

There are scattered deposits of minerals, but only the coal of the British portion has served as the basis of manufacturing to any extent. Elsewhere, besides farming the chief resource is fishing, for the region is too remote from the busier districts of the continent for trading to be important. Hence the population is, with small exceptions, rather scanty. Even in Britain, as was explained in Volume I of this series, the Atlantic Margins differ markedly from the English Lowland, which belongs to the next minor region.

The Developed Lowlands and Wooded Uplands.—The map of climate regions in Fig. 15 shows that within this minor region there are modifications in the climate, particularly noticeable in an approach to extreme conditions towards the east. Moreover, a relief map shows that, apart from the Alps, there are in Central Europe considerable upland areas which are high enough to have distinctly cooler and wetter conditions than the adjoining lowlands; these uplands areas are indicated also on the map of structural regions in Fig. 1 as belonging to the Hercynian group or as due to foldings of the Alpine type.

Putting these facts together, it will be seen that this minor region of Temperate Europe comprises (a) lowlands of sedimentary material, and (b) uplands of generally older and more resistant rock, and that each of these groups is composed of a number of relatively small areas with climatic differences corresponding to their respective positions (see Fig. 21).

The former group is here labelled as "developed lowlands,"

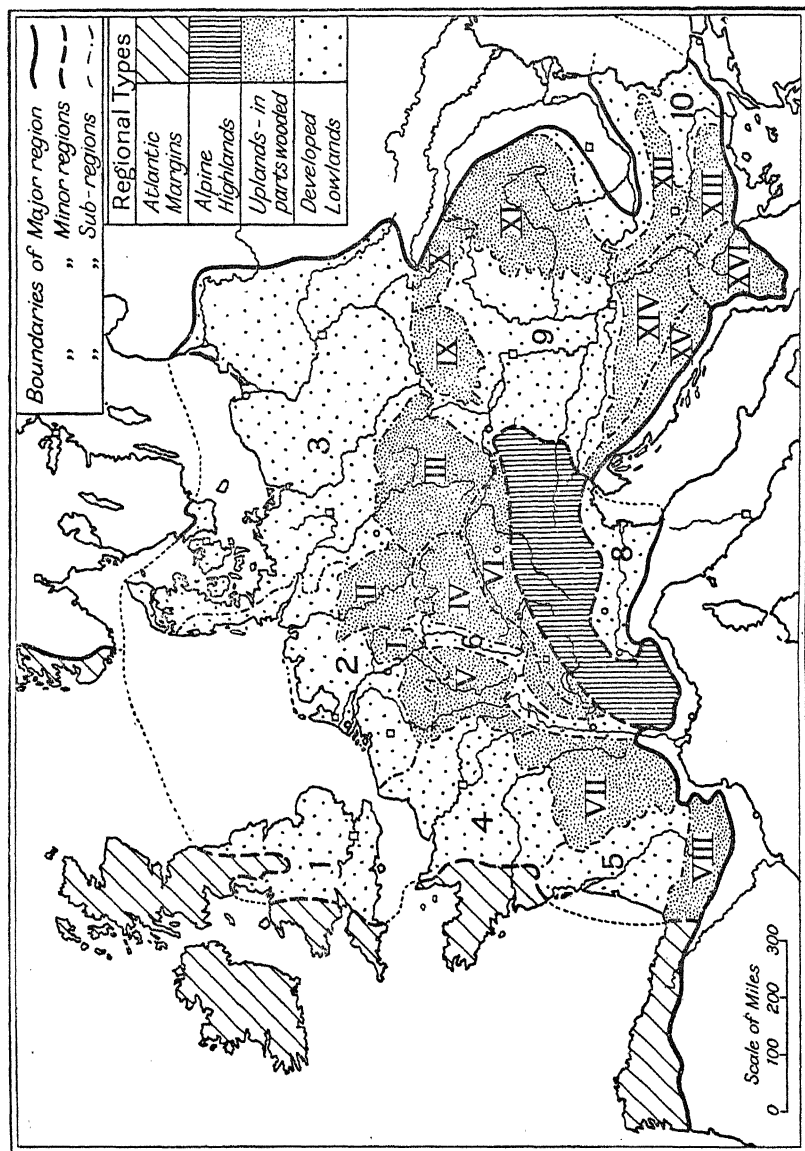


Fig. 21.—REGIONAL TYPES OF TEMPERATE EUROPE.

because their resources have been very thoroughly exploited and in them a number of districts have been largely transformed by human agency. In general, the climate and soil favoured early settlement, and for centuries men have used and improved the natural conditions, while even less-favoured parts, such as the marsh areas near the delta of the Rhine, have for various reasons also attracted settlers, who have converted them into productive lands.

Practically the whole of the lowlands are farmed, and much of the area is cultivated in an intensive manner, with a high yield as well as a great variety of products. According to the varying climatic conditions, rye, barley, wheat and maize are characteristic in different localities, generally associated in a rotation with other grains, industrial crops or fodder crops. Pastoral work in many parts is carried on in its most remunerative form, viz. dairy farming, to meet the needs of large urban populations. Minerals, too, have been exploited where they exist, particularly where coalfields dip down from the Hercynian Uplands under the margins of the lowlands, and some of the greatest and most densely populated industrial regions of the world have grown up in these lowlands.

The "drowning" of the continental margin has brought the sea far into the region, and from much of the interior of Europe the rivers bring traffic to the English Channel, the North Sea and the Baltic Sea. Because of the great amount of manufactured goods produced in the region, and the need of the dense populations for raw materials and food, commerce has developed here as in few other parts of the world and many important trade routes meet in the lowlands, as is shown in Fig. 20; there are also great ports, especially near the mouths of the rivers on the continental and English shores of the North Sea. Manufacturing and trading have thus led to immense urban development in the more northerly of the lowlands, viz. the English Lowland (numbered 1 on the map in Fig. 21), the North Sea Lowlands (2), the South-West Baltic Lowlands (3), and the North French Lowland (4).

On the other hand, some of the more southerly regions have more favourable climatic conditions and give a greater return to agriculture, as is exemplified in the Basin of Aquitaine in France (5), the Rhine Rift Valley (6), the Rhône-Saône Trough (7) and the North Italian Plain (8). On the eastern side a lack

of rain may be a handicap in the Middle Danubian Lowlands (9), while a transition to steppe-like conditions is observed in the drier South-eastern Lowlands (10), which include the Walachian Hill-lands and the East Balkan Lowlands.

Each of these ten areas has sufficient unity within it, and sufficient difference from its neighbours, to be regarded as a distinct sub-region of the "Developed Lowlands and Wooded Uplands" of Temperate Europe.

The uplands of Temperate Europe, with their cooler and wetter weather, are less suited to crop growing; they have considerable areas given to pasturage, but their characteristic vegetation-cover is forest. There is quite a variety of trees, and forestry is one of the chief occupations. The minerals, which in a number of districts first attracted settlers, have in several cases been largely worked out, and only relatively small industries are based upon them. Trade naturally avoids the higher areas (again see Fig. 20), and because of these combined conditions, the uplands are, in general, the homes of much smaller populations than the lowlands.

These uplands form a number of distinct sub-regions, which may be grouped according to their position. The Central Uplands of Europe comprise the Rhine Plateau (marked I in Fig. 21), the Weser-Saale Hill Country (II), the Bohemian Diamond and its margins (III), the East Rhine Scarp-lands (IV), the West Rhine Scarp-lands (V), the Jura Mountains and the Alpine Foreland (VI). In western Europe are the Central Plateau of France (VII) and the Pyrenees (VIII). On the eastern side are the three Carpathian sub-regions (IX, X and XI), and five more constitute a great part of the Balkan Peninsula (XII-XVI).

The Alpine Lands.—The great differences in elevation make it difficult to summarize the characteristics even of this relatively small minor region. It may be briefly said that the valleys provide sites for settlement, and offer opportunities of farming and other occupations which support the comparatively small numbers of inhabitants, while through some of the valleys pass routes connecting central and north-western Europe with the Mediterranean region. At higher altitudes forests supply timber, and still higher are summer pastures to which animals and people migrate for a few months. Above this habitable zone, dwarf shrubs, low cushion-like growths, lichens and other forms of alpine flora appear in summer and recall, in the heart of

Temperate Europe, the plant-life of the Arctic Region ; in the highest zone of all, only steep slopes and culminating peaks of bare rock emerge from snow-fields.

Peninsular and Trunk Europe.—We may regard Peninsular Europe as that part of the continent which adjoins the Atlantic Ocean and has been given peninsular form by the penetration of the North and Baltic Seas on the north and the Mediterranean Sea on the south. It may be broadly limited eastward by a line drawn through the Gulf of Bothnia and the Baltic Sea to near the mouth of the Niemen (Nemunas) River where Temperate Europe adjoins the Sub-boreal Farmed Forest Region, and thence the limit approximately follows the boundary of Temperate Europe to near the delta of the Danube.

By such a division, both Peninsular and Trunk Europe include portions of several geographical regions, but the former is more open to maritime and western influences, while the latter has a continental and eastern orientation.

Note.—It is emphasized that all methods of dividing the earth's surface into regions are simply useful devices for better understanding of the conditions. It aids judgment and memory to mark out and name areas with special characteristics such as a type of climate. Yet as certain climatic elements may seem of special importance when considered for particular purposes, so boundary lines and labels may show corresponding variations.

Geographical regions give most help in understanding the totality of the interacting factors. Each student may select for himself the most significant factors, give them due weight, and draw his own map. The construction and critical examination of such a map is valuable, although it is impossible for it to be accepted by all.

When writing this book the author marked and named regions to bring out, primarily, the similarities and differences within Europe ; when writing the volume *A World Survey* it was necessary to compare those of the whole world—in which the contrasts are greater. Hence the two sets of regional maps differ somewhat, and to show their relationship some alternative names and boundaries are indicated in Chapters II and IV of this book.

CHAPTER V

THE PEOPLES OF EUROPE

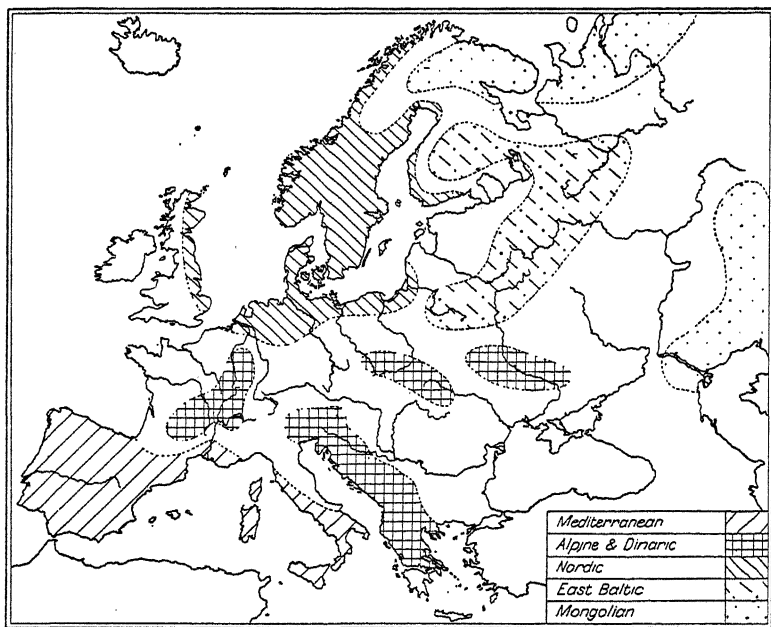
IN the preceding chapters the people who live in the various parts of the continent have been referred to mainly in relation to their respective environments ; we will now consider the peoples themselves.

The Racial Elements.—The physical characters of people are fundamentally determined by their descent, being handed down from generation to generation, and are therefore taken as indications of the race to which people belong. It is important to restrict the term “race” to groups of people who have in common a number of physical characters due to a more or less common ancestry, and never to use the term to denote groups who, although speaking the same language, or having the same religion, or being members of the same political State, nevertheless differ from one another physically because they have a mixed ancestry.

Anthropologists classify the greater part of mankind into three main racial or ethnic groups, distinguished from one another by the structure of the hair and the colour of the skin. These three groups are : (i) that of the negroes with woolly hair and black or very dark skin ; (ii) that represented by the Chinese and other Mongolians with straight, lank hair and yellowish skin ; (iii) the group to which the peoples of Europe mainly belong, with wavy or curly, yet smooth and not woolly hair, and with skins which are more or less white or light brown.

Among the Europeans, the various shades of skin colour are often, but by no means always, associated with the colour of the hair and eyes : a fair skin is in many cases accompanied by light-brown or even yellow hair and by blue or grey eyes, while the rather darker-skinned people commonly have dark-brown eyes and black hair. These contrasts between fair and dark are very clearly seen by comparing the typical Scandinavians showing the former characters, with the inhabitants of southern Italy showing the latter, and they are so marked that they are taken as indicating distinct racial or ethnic stocks, to which the terms

"Nordic" and "Mediterranean" are respectively applied. People belonging to the Nordic type constitute a considerable proportion of the inhabitants of the northern plains of Europe west of Russia, and those of the Mediterranean type form a majority of the population of the western Mediterranean lands (see Fig. 22). Between them, in the highlands and uplands of Central Europe, most of the people have an intermediate



[After Günther.]

FIG. 22.—DISTRIBUTION OF PREDOMINATING RACIAL TYPES.

Note.—The shaded areas are those in which the respective racial types are common. In the intervening areas the mingling is so great that no type can be regarded as characteristic.

grade of coloration with chestnut-brown to black hair, and hazel-grey to brown eyes. Moreover, the people of the Nordic stock are generally tall, those of the Mediterranean stock are relatively short, while those of the central uplands and highlands are of medium height.

Yet these intermediate conditions of coloration and stature do not result from a mixing of the other two racial stocks, for they are commonly associated with a quite different shape of the head. Both the Nordic and the Mediterranean stocks are

characterized by "long" heads, that is, the length of the skull from front to back is markedly greater than the breadth from side to side, whereas the inhabitants of the central uplands and highlands usually have rather broader heads. Hence the peoples here are representatives of another racial stock, and to these people the name "Alpine" is applied.

Closely associated with these Alpine peoples are another group who are also broad-skulled, but do not resemble them in appearance, for they have a greater stature, a more slender figure and a longer face. They are numerous in the coastlands north-east of the Adriatic Sea, and for that reason this group is known as "Dinaric" or "Illyrian." Judging by the physical criteria, members of this stock spread northwards and now form one of the important racial elements in the plains of Silesia and south Poland.

The three ethnic groups—Mediterranean, Alpine-Dinaric and Nordic—together comprise the greater part of the population of Europe, and it is therefore commonly stated that there exist these three European races.

The ancestors of these groups worked their way into Europe thousands of years ago, displacing or mingling with the scattered hunting peoples who had occupied the south of the continent during the Ice Age and had moved northward as the climate improved and the ice retreated.

Of the three main races, peoples of Mediterranean stock were the first comers. Long before 4000 B.C., perhaps about 8000 B.C., they settled on the warm and fertile shores of the great sea; there they had opportunities for growing grain and fruit, and for extending westward in Europe the civilization which had arisen in Egypt, Mesopotamia and the lands around the eastern part of the Mediterranean. In course of time they passed around the Iberian Peninsula to the Atlantic coasts, and thus reached the west of France and the British Isles (see Fig. 23).

Later, when climatic conditions in central Europe had become more favourable, the Alpine peoples migrated from Asia Minor and extended their settlements along the uplands and the neighbouring lowlands drained by the Danube. The loess areas of central Europe, fertile and free from forest, favoured the agriculture and pastoral work upon which they depended. They gradually worked their way westward into the valleys of the Alps and over the upland areas of what are now southern

and central Germany, Belgium and central France. The related Dinaric peoples followed those of the Alpine stock by much the same routes through the Balkan Peninsula and into central Europe, but they did not penetrate so far westward.

At a very much later date one branch of the Alpine stock spread from the Carpathian region into the adjoining plains to the north and east which now form part of Poland and Russia. These peoples are known as Slavs, and their descendants form a considerable proportion of the Russian people. A further migration southward gave rise to another group, the South Slavs or Yugoslavs, who occupied much of the Balkan Peninsula.

The ancestors of the Nordic peoples seem to have entered Europe after the Mediterranean and Alpine immigrants; originally pastoralists, they migrated across the plains of southern Russia, and eventually settled in the lands around the Baltic Sea.

Associated with the greater stature of the Nordics is usually greater physical strength than that of the peoples of the other stocks, and this doubtless helped them, at a much later date, to spread southwards and, in many instances, to conquer other peoples and to occupy parts of western, central and even southern Europe. For example, there were the settlements in Britain by the Angles, Saxons, Jutes and Norsemen, the incursions of the Goths into the Balkan Peninsula and Italy, and the penetration by the Vandals into the Iberian Peninsula and even into northern Africa.

Besides these peoples who have been so long established in this continent that they are regarded as truly "European," there are others whose origins are more recently Asiatic, and who are related to the Mongolian races of Asia. The Samoyeds have migrated from Asia into the northern forests and tundra of Russia, and the Lapps have spread even into the north of Scandinavia. They belong to the Ugrian racial group, who are characterized by broad heads and rather short stature, and often have a flat face and prominent cheek-bones; the slanting eyes which are shown most strikingly among the Chinese and Japanese appear among the Samoyeds, and occasionally among the Lapps.

Allied to the Ugrian folk are the Finnish group of peoples who had earlier worked their way across the Ural Mountains into

northern Europe, and now occupy the greater part of Finland and the adjoining region of Karelia across the Russian border. Yet the Finns of the present day do not show the characteristic Mongolian features to the same degree as the Lapps or the Samoyeds, probably because the original Finnish immigrants here settled in an already populated area. It frequently happens that a group of intruders may dominate an area and intermarry with the inhabitants, upon whom they impose their name,

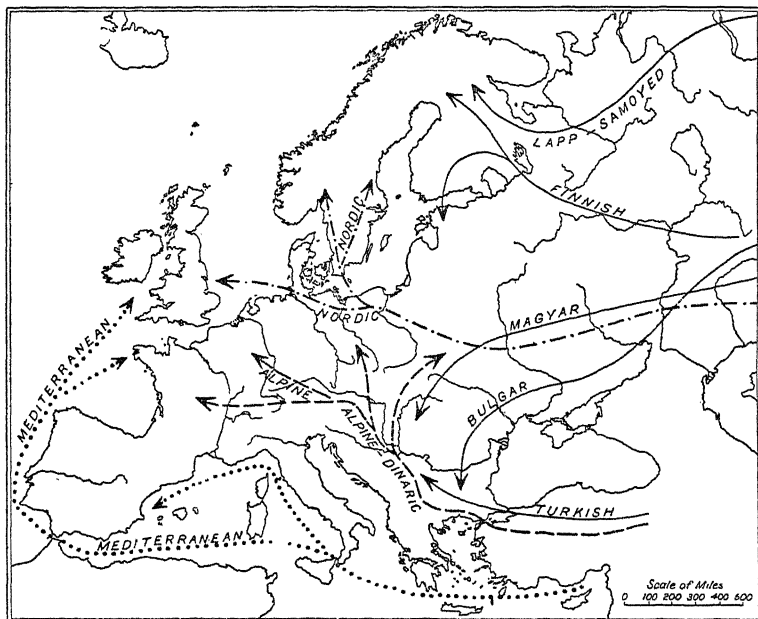


FIG. 23.—RACIAL MIGRATIONS INTO EUROPE.

language and traditions; yet, if these subject people are relatively numerous, in the course of generations the blood of the dominating group becomes progressively diluted, as it were. Hence, anthropologists are frequently faced with the fact that the name and speech of a people suggest one origin, and their physical features another. In the case of Finland it is certain that, in spite of the absence of Mongolian features, some of the ancestors of the present Finns migrated from northern Asia.

South of the Gulf of Finland are the Ests or Esths of Estonia, who are closely related to their Finnish neighbours. Moreover, in all the East Baltic region there are many individuals of a

type which seems to have resulted from a mingling of stocks of northern Asiatic and Nordic origin. These people are regarded as having by now been welded into a distinct ethnic sub-group, called East Baltic (see Fig. 22), and they form part of the population of a very wide area extending into Prussia on the west, Russia on the east, Finland on the north, and Latvia, Lithuania and Poland on the south.

Rather more recent immigrants from Asia of definitely Mongolian origin and speaking Ugrian languages came by a more southerly route along the steppe-lands. The Bulgars were nomadic horsemen, who in the seventh century A.D. crossed the lower Danube, conquered the Slav inhabitants and gave their name to Bulgaria. But though their name and some of the traditions of the invaders have survived, the language of the Bulgarians is now in the main Slavonic, and the people show little of the original physical characters of the immigrants.

A century or two later, other Asiatic tribes swept across the steppes, and some of these worked their way across the Carpathian Mountains into the Pannonian or Hungarian Basin. One group of these invaders spoke a language which was compounded of two Asiatic elements, the Ugrian and the Turki; the people of this speech were the Magyars, and the present inhabitants of Hungary still retain the name Magyars and speak the Magyar language, though their physical appearance shows that they have altered but little the predominating Alpine stock of the Slavs whom they conquered.

At about the same time that south-eastern Europe was thus invaded, the Moors of northern Africa crossed into the Iberian Peninsula and for a time ruled much of that region; yet they did not make great changes in the racial composition or the language of the people of the Peninsula, and the results of their occupation will be referred to in later sections.

The last of the great invasions was that of the Turks, i.e. tribes speaking a Turki language; they came from central Asia, and one group, the Osmanli Turks, overran Asia Minor, occupied Constantinople in A.D. 1453, and forced themselves as masters upon the people of the Balkan Peninsula. But throughout their long and victorious advance, they freely intermarried with their subjects, and accepted as "Turks" many who adopted their Moslem religion. Thus the Turkish State known as the Ottoman Empire spread from south-western Asia over much

of the Balkan Peninsula, and imposed its rule upon that region, but, nevertheless, the Balkan peoples still remained mainly of Alpine, Dinaric or Mediterranean descent and retained Slavonic, Albanian or Greek languages.

Other movements of peoples have occurred, some of which must be referred to in the next section in connexion with the spread of languages, but it may already be realized that the contacts and conflicts of the various migrant peoples have resulted in a mingling of the population in such a way that few districts show a uniformity of type.

Languages.—To use the words "Aryan race" for the Nordic ethnic group is doubly misleading, for in the first place the word Aryan applies only to languages, and in the second place it denotes a widespread group spoken by the great majority of Europeans (see Fig. 24). The Aryan languages have extended over almost the whole of the continent of Europe and through south-western Asia into India. Hence they are also known as Indo-Germanic, though they include not only the German or Teutonic family of languages, but also Greek, the Romance languages which have derived from Latin, the Slavonic family and the Celtic languages, as well as others spoken by some of the smaller communities.

Although in some areas, as in Wales, two languages exist side by side and many individuals may speak both, it is nevertheless possible to show the broad distribution on a map. This is done in a generalized form in Fig. 24, and in more detail for the central part of Europe in the end-paper map within the back cover of this book.

It is not possible to say what were the languages of the earliest folk who came into Europe; only the later movements of people, during historical times, can be definitely associated with the spread of the present-day languages.

By the generally westward migrations of conquering tribes the pre-Aryan languages became extinct, the one striking exception being the Basque speech, which has survived in the mountainous borderland of South-western France and Northern Spain. With the language there have remained old customs and traditions, and even a feeling of a distinct nationality among the Basque folk; nevertheless, the physical characteristics of the people do not show a uniformity of racial origin.

Another early language which has survived in the west of

Europe is the Celtic tongue. It is a member of the Aryan group carried across Europe in successive waves of settlement about 1000 years B.C. by folk probably of mixed descent ; later these people were themselves displaced or forced to adopt the languages, Teutonic or Romance, of other conquerors. Hence Celtic is now found, in several varieties, only in the peninsulas and islands of the Atlantic Margins in Brittany, Wales, north-western Scotland and Ireland.

The Greek language is spoken in the southern part of the Balkan Peninsula, and on the islands of the Ægean Sea and Krete.

The Romance languages have a very wide distribution, for their spread resulted from the great extension of the Roman Empire. Italian is most directly derived from Latin, and is now spoken in the Italian Peninsula, the islands of Sicily and Sardinia, the North Italian Plain and some of the coast-lands north-east of the Adriatic ; it is also spoken in the part of Switzerland which projects southward to the edge of the North Italian Plain between Lakes Maggiore and Como.

East of Lake Como there are several small areas of the Alps in which the inhabitants of the mountain valleys speak distinct Romance dialects : Romansch or Rhaetic, Ladin and Friulian.

In the Iberian Peninsula, apart from Basque, are several languages belonging to the Romance family. The difference between them may be related to the invasion by the Moors, who at one time occupied all the Peninsula except the northern mountain regions, where the Christians held out and whence they reconquered the land. One line of reconquest spread the dialect of the north-west corner, Galicia, southward along the Atlantic region, thus leading to the growth of a distinctive language in all this western part of the Peninsula. Later, most of this area formed the independent State of Portugal, in which evolved the present Portuguese language. Hence the Galicians, or Gallegos, speak a dialect akin to Portuguese and markedly different from the Spanish language.

Spain was mainly reconquered from the north by way of the plateaus of Castile ; the Castilian rulers gradually extended their power over the whole of Spain, and thus Castilian became the standard form of the Spanish language.

In the north-east of the Peninsula the defeat of the Moors, allowed the return to Spain of refugees from France who brought

with them a dialect of the "Languedoc" spoken in the south of that country and akin to the modern French dialect Provençal; in eastern Spain this language became Catalan, and has spread to the Balearic Islands. In Catalonia, the north-eastern part of the Iberian Peninsula, the Catalan language has developed a considerable literature, and the distinctive language, traditions and literature have made the Catalonian people conscious of possessing a unity among themselves, and differing from the other peoples of the Peninsula.

The extent of the French language does not coincide with the territory of the French State, for while on the west Breton is spoken together with French, on the east the boundaries of the language and of the State diverge at several points. This is especially the case in three areas: (i) where the French speech extends into Switzerland, being spoken by about one-fifth of the population of that country; (ii) where German-speaking peoples live in French territory in Alsace and Lorraine; (iii) where French is the language of the Walloon people who form the population of the southern part of Belgium, viz. south of a line running approximately from east to west a little south of Brussels.

Rumanian is derived from the Roman language, as is clearly suggested by the native spelling of the name of the country—"Romania." It has been handed down from the provincials of this north-eastern outpost of the Roman Empire, but it has been greatly modified by the Slav-speaking and other peoples who have since then occupied the country. In most other parts of the eastern portion of the Roman Empire in Europe the later invaders have imposed their Slavonic speech, with the exception of Greece and Albania. In the latter mountainous country the Albanian language appears to be a survival of a primitive Aryan tongue.

The Teutonic family of languages probably had its home among the Nordic folk living in the plains around the west of the Baltic Sea and the south-east of the North Sea; thence settlements and conquests in all directions led to the development of distinct Teutonic languages among peoples of varied origin. In the north there are the Scandinavian languages, of which Danish and Norwegian are almost identical; Swedish is closely related to the other two.

The English language is based in the main upon the speech

of the Teutonic invaders, modified by Romance elements introduced as a result of the Norman conquest. Other westward migrations of Germanic peoples have resulted in the development of the Dutch language in Holland and of Flemish in Belgium. This latter language is very closely akin to Dutch ; it is spoken by the Flemings, who form rather more than half the population of Belgium and occupy the part of the country north of the Walloon area.

Southward the Teutonic languages have had a wide extension over lands in which the people show relatively little influence of Nordic stock, i.e. from the racial point of view. German is spoken not only in Germany, but also in the Alsace-Lorraine portion of France, over most of Switzerland, and in the upper Adige basin in Italy.

The greatest changes, however, have occurred on the eastern side of Germany, where there have been two opposed sets of linguistic currents. (i) There were German outward thrusts and settlements in the river-basins draining to the south-east Baltic Sea ; here the people had spoken Slavonic languages—especially Polish. (ii) The Slav peoples, at various times, have driven westwards from the present-day Russia into the lands of the Poles. and from the Polish area into Germany. In all these regions there resulted a complicated mingling of racial stocks and of languages. After the Second World War, however, new boundaries were set for the States concerned, and aliens (who generally spoke a different tongue from the majority) had to migrate. Thus the complexity is now reduced ; see end-paper map.

The Lithuanian and Latvian (or Lettish) languages, like the peoples, have a mixed origin. They are alike, and are modified survivals of an archaic Aryan type.

The Slav languages have spread over the greater part of east-central and eastern Europe. There is the western group, including Polish and the closely related Czech and Slovak languages. There is the southern group, which includes Slovene, Croat and Serbian spoken by the peoples who form most of the population of the Yugoslav (South Slav) State. Bulgarian is another of the South Slav group of languages.

The widest extension of the Slavonic-speaking peoples has been eastward into the previously scantily occupied forests and steppe-lands of Trunk Europe. Of the East Slav languages "Great Russian" is the standard literary form, and is spoken

by the vast majority of the Russian people ; " White Russian " approximates to Polish, as its geographical distribution would suggest ; " Little Russian " is the language of the Ukraine. The word " Ukraine " means borderland, and here the Russians had to oppose, and in course of time were to some extent influenced by, the invading horsemen from the Asiatic steppes ; consequently the Ukrainians developed differences from the Great Russians in several respects, and now Little Russian or Ukrainian is claimed to be a distinct literary language.

Lastly, there are non-Aryan languages of relatively recent introduction from Asia. In northern Europe, in addition to the speech of the relatively few Samoyeds, there is the Finnish group ; in the north-east are people speaking East Finnish dialects, while the West Finnish languages are spoken by the Karelians, the Lapps and the Finns themselves. These last people have developed the Finnish language proper and created a Finnish literature. Another west Finnish speech has spread southwards across the Gulf of Finland and has there become the Estonian language.

Magyar belongs to the same Finno-Ugrian family, although it has been carried into distant regions and imposed upon other peoples ; hence the Magyar speech of Hungary and Transylvania contains quite different elements from those of the Finnish group.

Of the other " Asiatic " languages, Turkish is now spoken by few people beyond the borders of the Turkish State, and the allied tongues of the Kirghiz, Kalmucks and other peoples of the south-eastern margins of Europe are giving way before the advance of Russian colonization and government. In the Caucasus and Transcaucasia there are spoken various non-Aryan Caucasian languages.

It will be observed that while Peninsular Europe has been influenced by many language developments and their associated forms of culture, Trunk Europe has seen the extension only of the Eastern Slav and the relatively late Asiatic groups of languages.

Religions.—It would be out of place here to attempt to state the faiths of the various religions or the effects they have upon individual people, but the religions have a geographical significance because the churches into which they are organized have had effects upon political, social and economic affairs. while their distribution is related to geographical conditions.

Christianity was adopted as the creed of the Roman Empire, and its spread was influenced by the extent of that power, but Christian missionaries carried even beyond the Empire both their faith and also such advances as reading and writing, better methods of cultivating the land, and various handicrafts; hence the spread of religious ideas was often marked by a spread of other forms of culture.

Because the Roman power extended over a great part of western Europe the allied religious and cultural influences had more effect in transforming the lives of the "barbarians" in the west than was the case in the east of the continent, and these influences were one factor in bringing about the greater development in knowledge, in arts and sciences, in forms of government, and in economic matters, which long characterized western as compared with eastern Europe.

In the eleventh century the Christian Church was permanently split into two portions: in the east was the Greek or "Orthodox" Church ruled from Byzantium (now Istanbul), and in the west was the "Catholic" Church ruled from Rome. From the original home of European civilization in the Mediterranean region the line separating the areas influenced respectively by the Roman and Orthodox Churches runs from the head of the Adriatic Sea first north-eastward and the northward to the Arctic Sea, as can be seen from the map in Fig. 25.

In the east of Europe the influence of Christianity was greatly weakened by exposure to the attacks of Asiatic intruders. In the Balkan Peninsula the Turkish occupation resulted in a widespread adoption of the Mohammedan religion, and although the Turkish rule has been withdrawn from nearly all the region, nevertheless the people of parts of Yugoslavia and Bulgaria and of most of Albania remain Mohammedan. Here, in south-eastern Europe, the tall minarets of the mosques give an "oriental" appearance to the villages and towns, and from their summits the muezzins call the people to prayer. The Moslem women are still veiled, and the men still wear the round, tasseled fez, although in Turkey itself these distinctive marks of the Mohammedan religion are banned in order to avoid religious animosities between the different sections of the Turkish population.

Farther to the north-east, over most of Trunk Europe, the spread of religious and cultural influences was hindered by geo-

graphical conditions, for between the Mediterranean region and the homes of the early Russians in the clearings of the "farmed forest" region lay the steppe-lands; along these open lands passed wave after wave of nomadic invasion from Asia, which prevented effective contact between north and south. For the many centuries before the Russians dominated the steppe-lands, the advances made over the rest of Europe could reach the

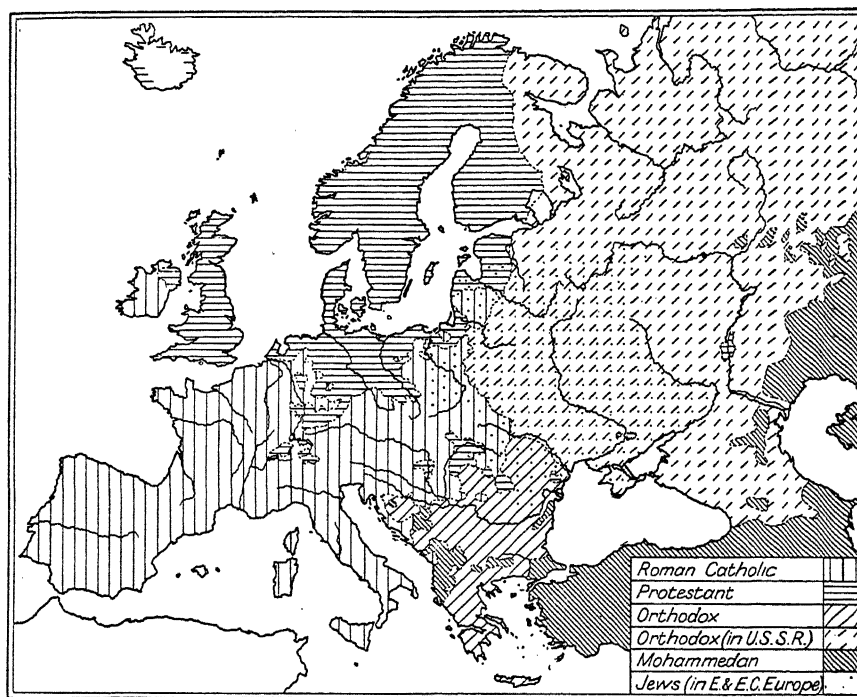


FIG. 25.—DISTRIBUTION OF RELIGIONS.

Russians only by a roundabout route through the Baltic Lands. This retardation is an important factor in explaining the differences between the peoples of Peninsular and Trunk Europe respectively.

The Orthodox faith at last spread over most of Russia and had a great influence for several centuries, but after the revolution of 1917 the new Government was so hostile to the Christian religion that now it is held, as a rule, only by people of the older generation who were brought up in that faith.

Yet one effect of its previous power is shown by the fact that here, as in the other countries in which some form of the Orthodox religion exists, the present alphabet is based upon the ancient Greek alphabet; on the other hand, in the countries to which the Roman Church extended the Latin alphabet is used, even though the language is not of the Romance family. The exception to this rule is Rumania, where the religion is Orthodox, but the Roman characters are used.

Yugoslavia illustrates the influence which religious differences may have on political conditions. The three peoples comprising the majority of the population are the Serbs, Croats and Slovenes, and, as stated in the preceding section, they speak similar languages, but while the Serbs are in the main of the Orthodox faith and have an alphabet derived from Greek, the Croats and Slovenes are Roman Catholic and use the Latin alphabet. These differences add to the difficulty of welding the three groups into one harmonious and firmly knit State.

After the close of the Middle Ages, a number of the States of northern Europe broke away from the Roman Catholic Church, and several Protestant Churches were formed; in determining the distribution of these new Churches the political power of the princes of that time was a greater factor than geographical conditions, and although the religious differences had very important consequences two or three centuries ago, they now count for less when one region is compared with another.

Separate reference must be made to the Jews as a religious community. Although a proportion of the Jews show a facial resemblance by an aquiline nose with a depressed tip and wide nostrils (characteristic of an "Armenoid" ethnic group related to the Alpine race), they have a very mixed racial origin. They have a language of their own—Yiddish—a blend of Hebrew and German elements, but they also speak the languages of the countries in which they have settled. The essential bonds between them are their religion and the traditions associated with it, and their feeling of difference between themselves and other peoples was often intensified by persecution and compulsion to live in restricted areas. Before the Second World War (as the map shows) they were largely in a belt overlapping central and eastern Europe, but large numbers were thrust out by governments, killed or displaced in war and scattered to distant

countries; only about half the pre-war number now remain.

Nationalities.—When a considerable group of people have lived together in one area and feel themselves to be bound by common ties to the extent that they wish to form a Government of their own, they may be said to constitute a “nationality.” The ties that unite the members of a nationality are various: belief in a common racial origin (whether this belief is justified by scientific knowledge or not); the use of a common language and the enjoyment of a common literature; sharing of a religion; living in one political state; association in defence against enemies. Any one or more of these factors may be powerful in creating a feeling of national unity, but any one or more may be lacking among the members of a nationality. Perhaps the most usual indication of a feeling of national unity is the possession of a common language, for this is the result of long association and helps intercourse between those speaking it; hence the map showing the languages of Europe is, as a whole, useful as showing the nationalities of Europe. There are, however, some marked discrepancies; e.g. the Swiss people certainly form a definite nationality, for they feel among themselves a unity which demands that they form a State independent of any other, yet among them are spoken four official languages—German, French, Italian and Romansch.

If a nationality is able to form a self-governing State, it is fortunate; if it cannot, it may become a minority within some State in which it is held against its will, and in that case its discontent may be a danger to peace.

Political States.—A State is an association of persons living under one Government and inhabiting a definite territory. The reasons for the existence and extent of a particular State are generally complicated and reach far back into history; it is clear from what has already been written that the members of a State are not necessarily bound by all the ties which have been discussed, though a feeling of a common nationality usually unites a considerable proportion of the subjects of a State. In the case of Switzerland we have an example of a State coinciding exactly with a nationality, while at the other extreme the Union of Soviet Socialist Republics (U.S.S.R.) is avowedly a multi-national State.

It is important to consider the relation of States to geographical conditions, and an examination of a map of the politi-

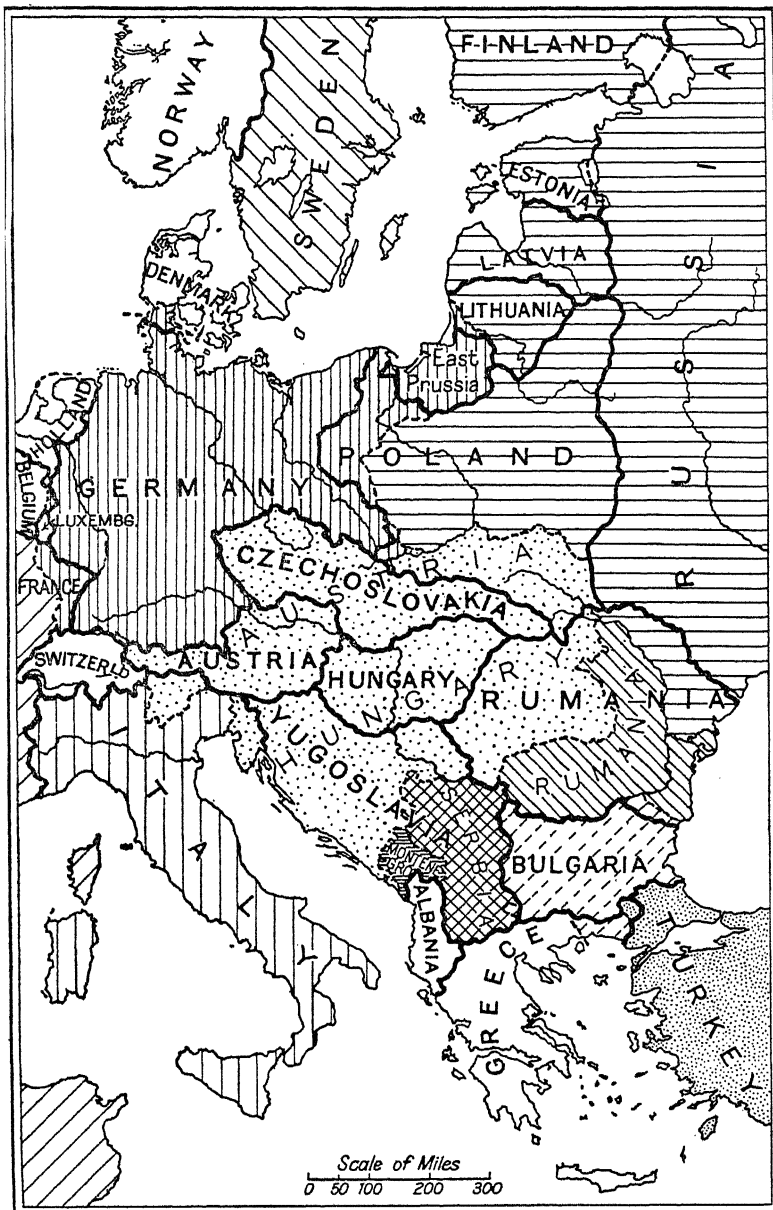


FIG. 26.—STATE BOUNDARIES BEFORE AND AFTER THE FIRST WORLD WAR.

Note.—The various shadings show the extent of the States before the war of 1914-18; the thick lines show the post-war frontiers. Compare this map with that in Fig. 81 (p. 355) in which the thick lines show the boundaries after the Second World War.

cal units in Europe shows that they seldom bear any close relationship to natural or geographical regions (see the end-paper map at the front of this book). Indeed, there is a strong tendency to the contrary, for a State may be tempted, if an opportunity arises, to make itself stronger by extending its territory into a region which is of a different type and possesses resources which it has hitherto lacked. A desire to be self-sufficing, or to secure access to trade-routes by which commodities can be secured from abroad, has in many instances been a factor in advancing the frontiers of States across regions of contrasting geographical character.

For this reason, political frontiers seldom coincide with the boundaries of geographical regions, although well-marked natural features, such as rivers or water-sheds, may be adopted as convenient and definite limits of States ; this is particularly the case when such a frontier offers a useful means of defence.

The difference between geographical and political units is brought out still more clearly when one thinks of the great and sudden changes which the States of Europe have undergone during the last hundred years or so ; old ones have disappeared, new ones have been formed, and others have expanded or shrunk to various degrees. Before and after the beginning of the twentieth century, rebellions led to the Balkan States being carved out of the former Turkish Empire, and since then these States have fought among themselves and changed their boundaries again and again. North of the Balkan region is the age-long " belt of political change " overlapping Teutonic Peninsular Europe and Slavonic Trunk Europe ; here, twice within the present century, major conflicts have transformed the political conditions.

In consequence of the First World War of 1914-18, several new States (shown by the thick boundaries in Fig. 26) were formed by the break-up of the great Austro-Hungarian and Russian Empires. The subjected minorities of Czechs and Slovaks in the north of Austria and Hungary formed Czechoslovakia ; in the north-east, Poles in Austria, Germany and Russia united to re-create an older State of Poland ; in the south, Slovenes and Croats joined Serbia and Montenegro to form Yugoslavia ; in the east the Rumanians of Transylvania were united to those of independent Rumania. By these changes two previously dominant peoples, the Austrians and the Magyars of Hungary, were shorn even of some areas in which

they themselves had lived, and were left only with the small States of Austria and Hungary.

In the case of Russia, besides the loss of much of the Polish territory, the Finnish subjects broke away and set up the modern State of Finland, while the Estonians, Letts and Lithuanians formed their three governments into what were known as the "Baltic States"; in the south-west, Rumania gained a large area mainly inhabited by Rumanians. Yet Russia itself remained a great Power although the Empire fell, for the Bolshevik government dominated huge areas in Europe and Asia. These were organized into a series of republics, territories and so forth, in which were created a system of "socialist" or "communist" institutions regulated by "soviets," i.e. councils. Hence the State as a whole is named the "Union of Soviet Socialist Republics"; these are 16 in number, Russia being the largest.

Other important changes occurred as a result of the First World War. The chief of these concerned Germany, which lost much territory to its neighbours who claimed that it had incorporated their nationals within its boundaries. Thus in the east, Germany had to cede so large an area to the new Poland that East Prussia was isolated within the Slav lands; in the north and north-west, Denmark and Belgium had small gains; in the south-west, the long-disputed province of Alsace and the greater part of Lorraine were restored to France. With the cessions of territory and population Germany lost also valuable deposits of coal, iron and other minerals, and its economic resources and activities were seriously curtailed; the resultant bitterness was a great factor in bringing about the outbreak of another war. It will be noticed that an outcome of the First World War was a check to the earlier eastward thrust of German power and a corresponding westward advance of the Slavs.

In 1938 and 1939, before and at the onset of the Second World War, there was a German conquest of Austria, Czechoslovakia and Poland, but at the close the tide had turned and the Slav States of U.S.S.R. and Poland had pushed west. This can be seen from the map in Fig. 81 (p. 355) where the post-war boundaries are shown by heavy lines; in some cases these boundaries were still provisional more than five years after the war ended in 1945.

• The Soviet Russian Republic now thrust its frontiers with Finland westward both along the shores of the Baltic Sea and

farther north, while in Central Europe it incorporated the three Baltic States and part of East Prussia. North-eastern Poland was acquired by the Soviet White Russian Republic on the ground that most of the people were of its nationality ; farther south, on similar grounds the Ukraine Republic obtained south-eastern Poland and the eastern Carpathian " tail " from Czechoslovakia ; nearer the Black Sea, Bessarabia was regained from Rumania by the Moldavian Republic.

Poland's loss to U.S.S.R. was more than balanced by its seizure from Germany of most of East Prussia and a wide area to the west as far as the lower Oder and its tributary the Neisse, giving it ample access to the Baltic Sea ; furthermore, it now possessed all the area southward to the Czech lands including the whole of the Silesian coal- and ironfield.

Germany suffered further, as even its remaining territory lost political unity, at least for a time, for at the end of the war its government disappeared and was temporarily replaced by administration by the conquering Powers. This was organized in two separate zones : an eastern one under Soviet domination and a western one at first supervised by the U.S.A., British and French governments. A similar division of Austria was made pending the conclusion of a Peace Treaty.

The geographical conditions of practically all Europe were seriously affected by the war. Violent changes in production and trade were almost universal ; destruction of equipment and buildings were serious or even disastrous in all the belligerent countries ; the overrunning by war and the post-war cessions of territory were followed by migration or displacement of millions of the inhabitants ; actual warfare and the consequent privation and disease meant the death of other millions. The effects of such catastrophic happenings are taken into account in Part III of this book, which deals with the individual States.

PART II

THE REGIONS

CHAPTER VI

THE NORTH SEA LOWLANDS

THE traveller from England to the Continent, crossing the Strait of Dover towards Calais, sees before him the chalk cliffs of France which are the counterpart of the North Downs. As he nears the coast, however, he observes that his boat passes to the east of the chalk country and approaches a low shore which stretches eastward as far as the eye can see.

Calais marks the beginning of a great lowland region, which forms the north-eastern corner of France and extends behind the North Sea through Belgium, Holland and northern Germany, and along the western side of Denmark (see Fig. 30).

With occasional breaks there is a coastal strip of dunes, and this has behind it a belt of natural marsh-lands, much of which is now transformed into polders, interrupted by shallow inlets of the sea. Behind the marsh-lands is a rather higher area, partly sandy country to which the term "geest" is applied, and partly fertile agricultural plains or low plateaus. Near the uplands of central Europe which form the boundary of the lowlands occur coal deposits, and associated with the mining of the coal are important industrial areas (compare the map in Fig. 30 with the section in Fig. 27). Thus the whole of the North Sea Lowlands region is composed of a series of belts running in a general south-west to north-east direction as far as the south-eastern angle of the North Sea; here, in the peninsula of Jutland, the coastal belts change their direction and run from south to north, while the belt of fertile plains is no longer to be observed, but gives place to another type of country near the Baltic Sea. The North Sea Lowlands region has characteristics marking it off from the neighbouring areas, and it may therefore be regarded as one of the sub-regions of the "Developed Lowlands and Wooded Uplands" of Temperate Europe (marked "2" in Fig. 21).

The surface conditions of the region are in the main due to its position on the south-eastern margin of the shallow depression now invaded by the waters of the North Sea. To this depression rivers drain through the North Sea Lowlands from all the surrounding regions: the Schelde (Scheldt or Escaut) and its tributary the Lys from the scarp-lands of northern France; the Meuse (Maas), the Rhine and the Weser from the Central Uplands of Europe; the Elbe from the South-west Baltic Lowlands and the Central Uplands. Consequently these rivers deposit alluvium in the marsh-lands of this lowland. The sea, too, plays its part in the building up of the coast; strong tidal currents drag sand eastwards along the shores, and the prevailing and occasionally stormy westerly winds heap it up to form the belt of dunes.

In the past, however, conditions have been different, particu-

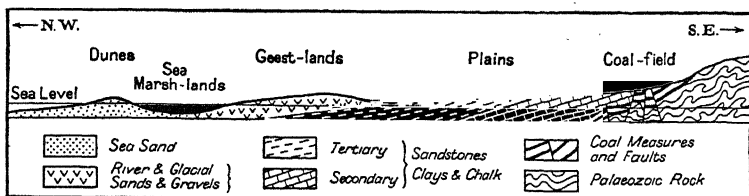


FIG. 27.—DIAGRAMMATIC SECTION THROUGH NORTH SEA LOWLANDS.

larly because of changes in the relative levels of land and sea. During parts of the Secondary and Tertiary Eras, the sea covered much of the region, and beneath its waters were laid down marine clays and sands, and in parts even chalk, which now constitute the fertile interior plains. In the later part of the Tertiary Era, moreover, the rivers accomplished much more work than they do at present: they deeply dissected the uplands to the south, and with the eroded material they built up the huge accumulations of sand and gravel which form much of the geest type of country.

Oscillations of level have characterized also the later geological history of the region. Thus at the close of the Ice Age the land was relatively higher, and the present area of the North Sea was above the sea-level. Since then, however, there has been a general rising of the sea-level, and in early historical times the waters had advanced to the line indicated by the islands and dunes on the outer edge of the present coast. Here

was a continuous line of dunes behind which lay marshes broken only by one great lake in the Zuider Zee hollow. These marshes were gradually drained and occupied by men, but Nature has worked against them: the alluvium tends to consolidate and settle down, and very possibly a relative sinking of the land occurred, and in consequence in the Middle Ages the sea broke in; moreover, wars caused the neglect or destruction of the defences, and altogether some thousands of square miles were lost. In modern times the work of protection has been resumed, and now, in spite of occasional and local floodings, the struggle goes in favour of man.

The position of the region determines its climate, which is broadly similar to that of eastern England, although its continental situation gives it rather colder winters, particularly in its eastern portion (compare the temperature statistics for London and Brussels, given in the table on p. 26). Consequently, the farming possibilities of the North Sea Lowlands are in general like those of eastern England, and differences in production are due largely to soil or economic conditions. We will now consider in turn each type of country constituting this region.

The Dune-lands.—The sand is least in amount in the French and Belgian part of the region, where the available material is mainly that which has been driven through the Strait of Dover, but becomes far more abundant by accumulation towards the east. Moreover, the dunes are highest and broadest where a stretch of north-to-south coast directly faces the westerly winds, as in Holland and in Denmark. The line is, however, broken at areas of relative depression, and channels are kept clear where the currents due to the high tides of the region sweep up and down the entrances to the great rivers.

Where the sand-dunes form a protection against the flooding of the marsh-lands, they have been strengthened by the planting of grass, shrubs or trees and by the construction of groins. Upon the dunes have been built fishing villages and health resorts, e.g. Scheveningen near The Hague in Holland, and Ostend in Belgium; the latter town is also a port with rapid communication across the North Sea to England. Similar ports, but with much more traffic, are Calais, which has the shortest crossing, and Dunkirk (Dunkerque), for these are the French outlets of the industrial area which depends on the coalfield of north-eastern

France. Farther east are "out-ports" at the entrances to the great rivers, e.g. in Holland are Flushing by the Schelde, and the Hook of Holland by the Rhine.

In Germany, the dune-lands are represented only by the Frisian Islands, but in the Danish part of Jutland they again form part of the mainland. Here has been constructed the port of Esbjerg, connected by railway with the east of the country in order to facilitate the rapid transit of its dairy produce, especially to England.

Throughout their extent, the dune-lands are of similar origin and characteristics, and they therefore constitute a distinctive though small region, to which we give the term "tract." It must be observed, however, that this tract is not continuous, as most others are, because it is broken by the waters; it may therefore be regarded as a "discontinuous tract."

The Marsh-lands.—Behind the line of dunes and islands, the shallows are constantly covered by water only over a relatively small extent. There are other areas, particularly marked behind the various Frisian islands, which are mud-flats at low tide, but water-covered at high tide. These are known as *watten* or *wadden*; they may be regarded as land in the making, and the natural deposition of mud and sand is aided by fences built out from the land, the resultant accumulation being used for summer grazing as soon as it is covered by vegetation.

The Sea-marshes.—Much more work has been required to form the polder-lands. Near the coast are the sea-marshes, which in Holland are even below the mean sea-level, and everywhere are liable to inundation at high tide or in times of storm; farther inland are the river-marshes, which, though well above sea-level, need protection from flooded streams.

Reclamation of the sea-marshes is still going on. The Zuider Zee (the name "South Sea" was given by Frisian fishermen) is now shut off by a dyke across its mouth, and four polders with a total area of about 800 square miles are being formed on its margins, the water area being limited to a central "Ijsel Lake" fed by the waters of the Ijsel tributary of the Rhine, as shown by the broken lines in Fig. 30.

The utilization of the polder-land varies partly according to the nature of the soils, sometimes clayey and sometimes sandy, and partly according to the traditions of the people or the economic demands of the neighbouring regions. In the small

strip of the French marsh-lands behind Calais and Dunkirk there is intensive cultivation of industrial crops, mainly beet, flax and chicory, which is associated with the manufacture of their products, sugar, linen and chicory ; wheat and barley are also grown. In the Belgian strip similar crops are produced, though cattle-rearing assumes some importance. In the broader polder-land region of Holland, there are again the cereal and industrial crops, but pastoral work predominates, and butter, cheese and milk are the main objects of the farming.



[Netherlands Information Bureau.]

FIG. 28.—VIEW NEAR HAARLEM.

Note.—The polder-land has been adapted for the cultivation of bulbs by drainage (note the canal), and by making the clay lighter by mixing sand from the pine-clad dunes shown in the background.

In Holland are two areas of special character. In a narrow strip behind the dunes near Haarlem the sand has been mixed with the muds and clays of the marsh-lands to produce a soil exceptionally well adapted to the cultivation of flowers. The horticultural industry, like several others, began when the Netherlands were one of the foremost maritime peoples of Europe ; tulips, hyacinths and other plants were brought from the East, and centuries of experience and organization have made the growing and export of many kinds of bulbs, flowers, shrubs and fruit an important occupation. The proximity of the port

of Rotterdam, with its rapid communications, has been a significant factor, and now a neighbouring aerodrome offers still quicker facilities for transport.

Farther south, the shelter of the dunes allowed woods to grow in past centuries, and here the counts of Holland had a hunting-box. This became their residence and was called "s'Gravenhage"—"the Counts' Hedge," in its English form, The Hague; it has now grown into a city of nearly half a million inhabitants, for it is the capital of Holland, and is also the seat of the International Court of Justice.

In Germany the marsh-land again narrows to a belt bordering the coast and the estuaries of the Ems, the Weser and the Elbe, while in Denmark it is not quite continuous but appears as areas surrounding lagoons. (These lagoons are known as Fjords, but like the neighbouring Lim Fjord, they are shallow depressions quite unlike the Fjords of Norway.) In the eastern part of the North Sea marsh-lands cattle rearing is the main occupation, and supports a less dense population than the more intensive farming common in the central and western polder-lands.

The River Marsh-lands.—Although lying above sea-level, these areas are subject to inundation by the rivers; in some parts they have needed reclamation, but in other parts they require only protection by dykes from occasional floods. These floods generally occur in winter, for most of the rivers have a "régime" in which the flow of water is greatest in the winter season, after the relatively heavy rainfall of autumn and when the run-off into the streams is least reduced by evaporation and the demands of the plant-covering of the land. The Rhine has a more uniform régime than that of the other rivers, for its headwaters come from the Alps, where the melting of the snow in the upper part of its basin provides additional water in summer; consequently, the main stream brings down a summer supply which balances the winter maximum of the tributaries of the middle and lower parts of the basin, which are dependent upon the rainfall.

Parts of the river flood-plains are used for tillage similar to that of the sea-marshes; elsewhere are long stretches of grassland, absolutely flat with their uniformity broken only by the dykes; here villages and even houses are rare.

Waterways and Ports.—Much of the importance of the North Sea Lowlands region is due to the rivers which direct into it

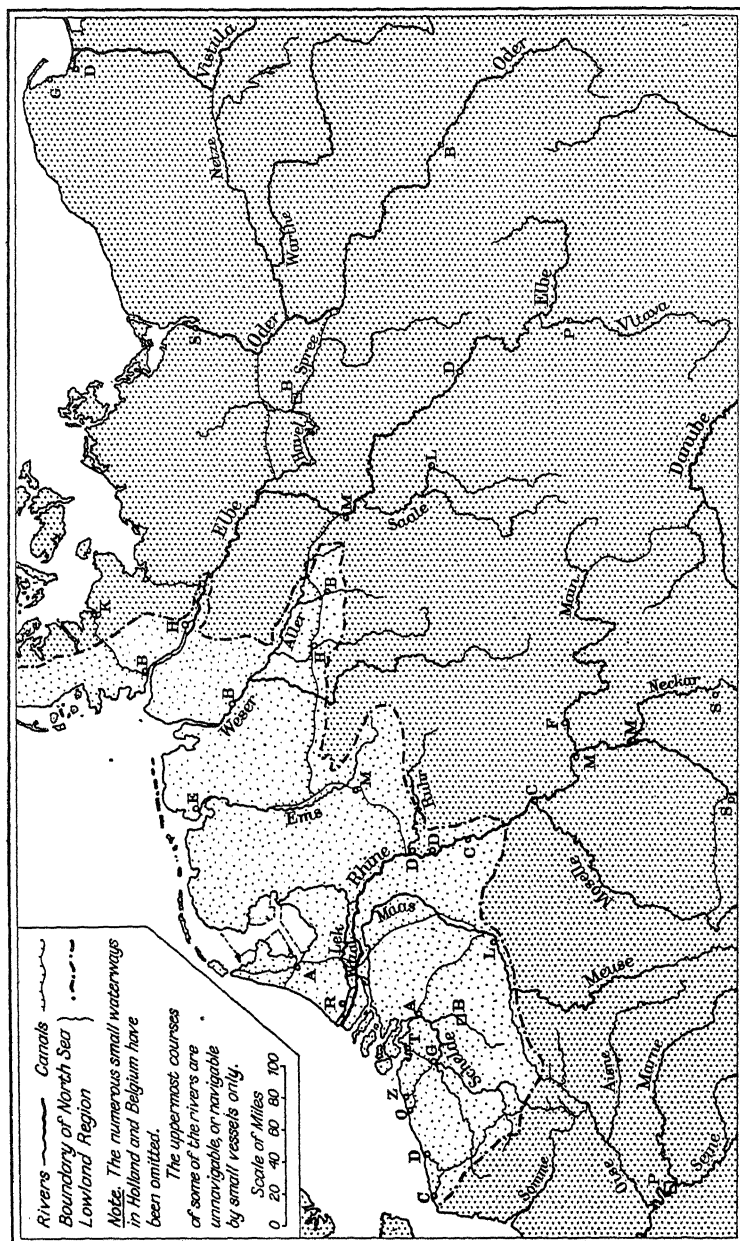


Fig. 29.—WATERWAYS LEADING TO THE NORTH SEA LOWLANDS.

communications from and to a great part of central Europe ; consequently, at or near the mouths of these rivers have grown up several great ports which make the region by far the most important commercial area of the continent of Europe (see Fig. 30). Moreover, most of these ports have been developed at points on the waterways where higher land forming suitable sites for settlement adjoins the marshes ; these sites are mainly at the inner margin of the marshes on the geest lands or the fertile plains, but at the western end of the region they are at the outer margin adjoining the dunes.

Hamburg has a very important position on the Elbe estuary, bringing ocean liners 70 miles inland from the North Sea. Fig. 29 shows that while the main stream gives communication with the industrial areas of Saxony and of Bohemia in the Central Uplands region, the Havel tributary leads from the Spree and Berlin ; also a system of canals links the Elbe to the other great rivers of Germany and Poland in the south-west Baltic region. Moreover, a little above Hamburg the Elbe-Trave Canal leads to Lübeck on the Trave, and from Brunsbüttel, near the mouth of the Elbe, the Nord-ostsee (i.e. North-Baltic Sea) Canal leads to Kiel and carries most of the traffic between the various Baltic Sea ports and the outer world.

Until the Second World War, Hamburg had an amount of trade which made it rank with London and New York as one of the greatest ports of the world. Its imports consisted of all kinds of commodities, while its exports were mainly of manufactured goods ; shipbuilding developed, and also manufacturing in many forms. Its population numbered about one and a half millions. With the post-war chaos in Germany and the separation into Western and Eastern Zones, the trade and importance of Hamburg diminished ; its future will depend upon political conditions.

Bremen, on the Weser, is nearly as far from the sea as Hamburg ; it is in the river-marsh area, and its trade is remarkable in having become the greatest tobacco market in the world ; its population is more than a quarter of a million. At the mouth of the Ems is Emden, but this port is of comparatively little importance, although the river is joined to the Ruhr industrial area by the Dortmund-Ems Canal ; the traffic of the Ruhr region mainly goes by the Rhine to the chief markets and the sources of raw material.

From near the junction of the Dortmund-Ems Canal with the Ems River, another canal leads east near the margin of the North Sea Lowlands (see Fig. 29). This is the Mittelland (Midland) Canal ; it crosses the Weser and its navigable tributary, the Leine, on which Hanover stands, and is now continued north of Brunswick to join the Elbe at Magdeburg. By its completion a through route of inland waterways connects eastern Germany and Berlin with the Rhine-lands.

The Rhine is incomparably the most important waterway of Europe. It is navigable for small vessels from Basel downstream, but its great amount of traffic is in the North Sea Lowlands region between the Ruhr and the sea ; while there are river ports of considerable size in German territory, the chief port of transshipment between ocean and inland transport is Rotterdam. This is the one striking exception to the rule that the great ports are on the margins of the marsh-land ; unlike the others it is of recent growth, and became important only when in the latter part of the last century the increase of German trade made it necessary to improve the navigation of the Rhine estuary. Then the " New Waterway " was cut : a deep channel was made from the North Sea at the Hook of Holland, and where the waters of the Waal and Lek were led into this channel at Rotterdam, in the middle of the marsh-lands, great wharfs and basins were constructed, and the port rapidly developed. Of the goods transhipped from sea-going vessels, the greatest amount goes inland up the Rhine, and most of the remainder by the system of canals which forms a network throughout the Netherlands and is without parallel in the world. Railway transport counts for little, one reason being because the traffic consists mainly of heavy and bulky imports, such as iron and other ores and metals for the industrial regions higher up the Rhine and grain for the food-supply of the dense populations of the Netherlands and Germany. With manufactures associated with the imports, particularly for use in Holland, Rotterdam has grown till it has a population of over half a million.

Amsterdam rose to importance centuries ago when the protected waters of the Zuider Zee gave access to the interior of the polder-lands of Holland, but the increasing size of ocean-going vessels made this shallow sea useless ; first the North Holland Canal was constructed through the peninsula to the entrance of the Zuider Zee, and later the North Sea Canal gave a direct

approach available for ships of any size. Thus Amsterdam, although rather off the main lines of communication, has been able to retain a certain amount of ocean traffic, and it affords an example of geographical inertia by the fact that it still remains the chief centre of the organization of the commerce (as distinct from the actual handling of the traffic) and of the financial business of the Netherlands. It also has industries which are traceable to its pre-eminence in trade in the days when Holland was a great colonial power, e.g. cigar making and tobacco preparing, sugar refining and diamond cutting. Moreover, Amsterdam has remained a professional and residential centre, and with more than three-quarters of a million inhabitants it is the largest city in Holland.

The lower Maas is inconvenient for commerce, for being without Alpine tributaries, it is subject to very low water in summer and to floods in winter; its middle course, however, is connected by a canal in Dutch territory from Maastricht to the Rhine estuary, and in Belgian territory by a canal from Liège to Antwerp on the Schelde (see Fig. 32).

The estuary of this latter river is the entry to a very considerable system of waterways which traverses all parts of Belgium and is joined to the rivers of north-eastern France. Where the Schelde enters the sea-marsh region Antwerp has grown up. This city has a population of more than a quarter of a million; it is the chief port for Belgian commerce, and its transit trade, mainly for Germany and Switzerland, is of about equal importance. Like Amsterdam, Antwerp has developed industries connected with its import of "colonial" wares. At the junction of the Lys and the Schelde is Ghent, a centre of local trade and small textile manufactures; from it one canal runs northward to Terneuzen in Dutch territory on the "West Schelde" inlet, and another leads westward to Bruges on the inner edge of the sea-marshes. Bruges was once a port, but its outlet has been silted up, and it is now joined to the sea by canals which cut through the dune belt to Zeebrugge and Ostend.

The canal which runs through French territory roughly parallel with the national boundary shows the influence of political conditions. While the natural waterways would direct traffic from the French coalfield to the Schelde and Antwerp, the desire to keep the trade within France has been an important factor in the construction of the canal which leads to Calais

and Dunkirk; the growth of these ports must therefore be ascribed in part to political causes.

The Geest and Moors.—Behind the tract-group of the Marshlands, extends another and strongly contrasted series of tracts, from near Antwerp north-eastwards to the borders of the Baltic Lands. These areas are in the main wide stretches of heathland known to the Germans as *geest*. In the west of the region from near the mouth of the Schelde to about the lower Ems, they have developed upon masses of gravels and sands which were brought down by the Rhine and Maas until the deposits formed a great fan-like plateau. The plateau was highest near the centre of its inner margin, dipping north-westward to the sea (see Fig. 27). Later it was dissected by streams, and great valleys were cut across it. The largest of these valleys are the two now occupied by the parallel courses of the lower Maas, Waal and Lek and by the Ijssel; consequently, the sandy plateau is divided into three masses: (1) the Campine or Kempenland, which overlaps the boundary of Belgium and Holland within the curve of the Maas; (2) the Veluwe, between the Lek and the Ijssel; (3) the West Frisian Geest, between the Ijssel and the Ems.

The words “Veluwe” and “Geest” both mean “barren land” and, apart from some woodland on the slopes, the vegetation cover of most of the area consists of coarse grasses and shrubby growths such as heather; the surface is dry and infertile, while in parts the finest sand is blown into small dunes. In other parts iron in the sand has formed a pan of impermeable rock upon which drainage is poor, and moors have developed with marshes, peat bogs and pools of stagnant water.

Reclamation of these lands, for long almost uninhabited, is going on, and “Fen colonies” grow potatoes, beet and some rye and oats. Yet these lands remain scantily populated, and the larger settlements are generally on their margins.

East of the Ems the *geest* is formed mainly of sands washed away from the morainic material deposited by the ice-sheet which extended from northern Europe, as shown in Fig. 3. The greatest of the moraines are shown on the map, and it is to be observed that they mark out the eastern limit of the North Sea Lowlands region.

Streams brought sandy material from the Baltic morainic areas into the eastern part of the North Sea Lowlands region,

where it is widely spread and is the basis of the geest-lands of this part ; moreover, among the dry sands occasional sheets of boulder clay play a similar part to that of the iron pans in the western geest-lands and give rise to similar wet moor districts. Reclamation of this type of country has gone on in Germany, but to a less extent than in the Netherlands.

In Jutland, the strong westerly winds have blown the sand from the dune belt inland to combine with that of glacial origin and form a broad belt of dry, infertile country ; the Danes have recently begun to afforest and cultivate the sandy heath-land, but this western part of Denmark remains by far the least valuable part of their country.

In the western part of the geest-land, however, there is another resource which may be developed ; beneath the Campine are deeply buried coal deposits : a "spur" from the belt of coal-fields of the southern margin of the North Sea Lowlands. The Campine field has a width of about 8 miles and a length of about 40 miles ; working has commenced near the Maas, but whether economic conditions will make a great extension profitable is uncertain.

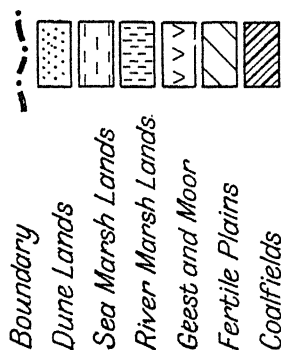
The Fertile Plains.—To the south of the tract-group of the geest-lands, sedimentary soils of Tertiary and Secondary age emerge from beneath the marshy alluvium and the sandy accumulations (again see Fig. 27), and form plains of relative fertility, while in certain parts this fertility is actually great, due to a superficial deposit of loess.

Owing to the complicated way in which the older rocks of the Central Uplands were faulted, raised and depressed, they project irregularly northward into the lowlands ; consequently, the fertile plains of the latter are in some parts narrow, but in other parts form wide embayments between the upland masses. Thus in the North Sea Lowlands region, four main tracts of generally fertile plains or low plateaus may be observed.

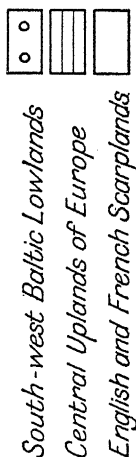
(i) In the easternmost tip of the region is a strip in which the towns of Brunswick and Hanover are situated and which narrows westward where it is crossed by the Weser. This *Loess belt of Hanover and Brunswick* is noted especially for its production of sugar-beet and other industrial crops as well as cereals. Along it run ancient roads and modern railways which skirt the uplands and connect Berlin with the cities of the Netherlands and of northern France.

Long. 16 E.

NORTH SEA LOWLANDS SUB-REGION



NEIGHBOURING SUB-REGIONS

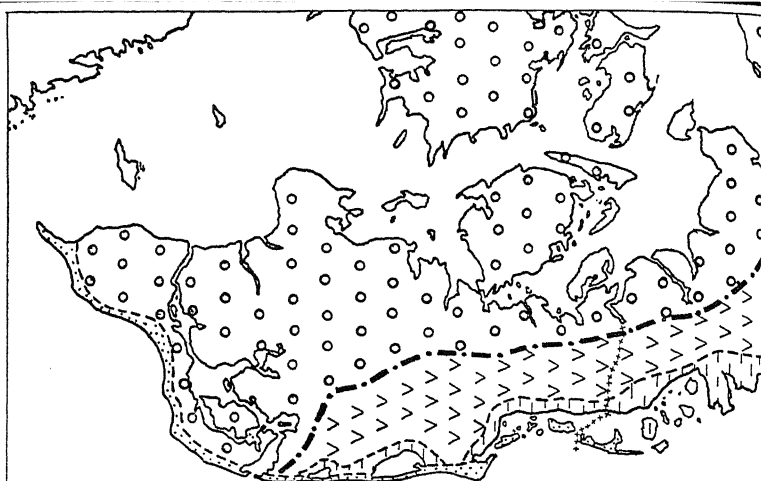


Political Boundaries

Scale of Miles



Lat. 54 N



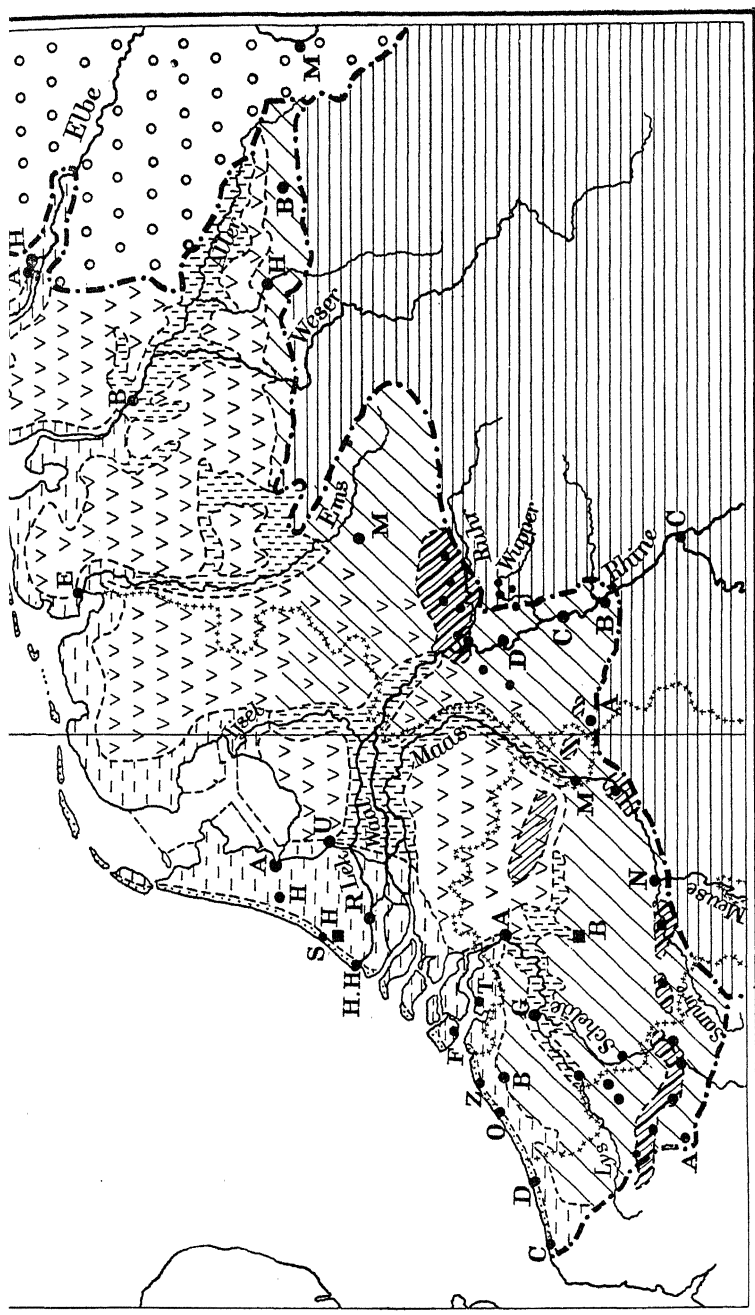


FIG. 30.—REGIONS OF THE NORTH SEA LOWLANDS.

(ii) *The Westphalian Embayment*, which may be called the Plain of Munster from the town which is its natural centre, is of mixed soils and varied production. On its north-eastern and southern boundaries it is well defined by the edge of the uplands ; on its north-western side it passes into an area which gradually

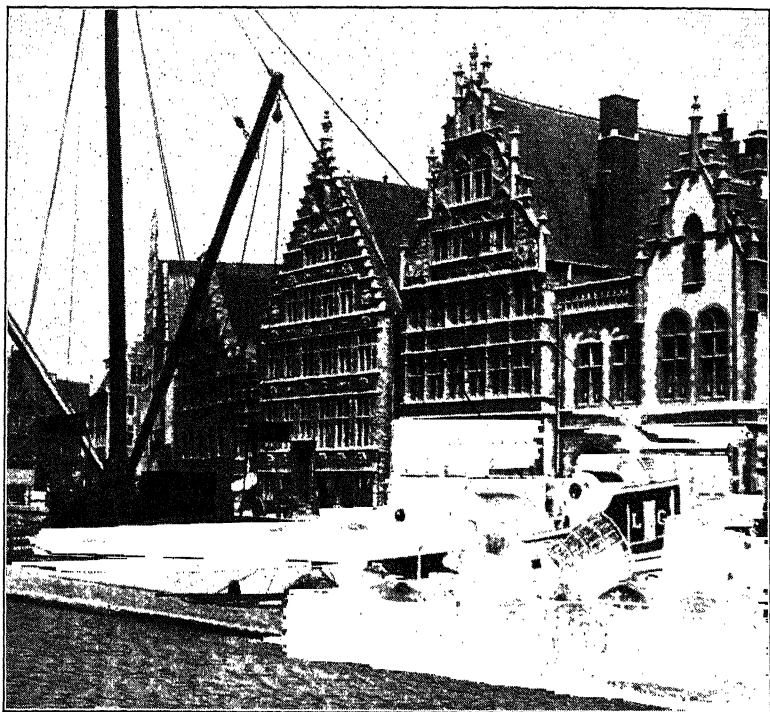


FIG. 31.—VIEW IN GHEENT. [Belgian Railways & Marine.]

Note.—The steeply gabled high houses are typical of Flemish-town architecture. The view shows the "Quai aux Herbes," by one of the small waterways, carrying barge traffic, largely used in Belgium and in Holland.

becomes more like the geest ; in the map of Fig. 30 this area is shown as transitional in its character, by the overlapping markings of both types of country. On the south-west of the Westphalian embayment the agricultural land of the plain is being invaded by the mining of the coalfield of the Ruhr region.

(iii) *The Cologne Embayment* is well defined on its southern and eastern sides, but on the north-west passes into transitional-geest country. The population of the Cologne embayment is great, for its agriculture is intensive, particularly upon a loess

covering in the south, while on the west side of the Rhine near Cologne there are deposits of lignite, or brown coal, a mineral which has been greatly developed in Germany in recent years (see Fig. 82). The Rhine, however, gives the region its greatest significance, for as a waterway it enables sea-going ships to reach Cologne, while its valley provides the most important route between southern and northern Germany and, indeed, between the Mediterranean and northern Europe.

Bonn marks the entry of the Rhine into the lowlands and has become the capital of the new Federal Republic of Western Germany. Cologne (Köln), a Roman "Colonia," is a focus of trade where the route which skirts the Central Uplands crosses the Rhine; with industries utilizing near-by lignite deposits and Ruhr-coal, it has grown to a city of over half a million people. Downstream is Düsseldorf, the river port for the industrial area of Wuppertal immediately to the east in the adjoining upland; at and about Düsseldorf a population of nearly half a million has congregated. Other centres of industry have developed west of the Rhine, e.g. München-Gladbach and Crefeld, famous for textile production.

(iv) West of the Cologne embayment the fertile belt narrows between the Ardennes area of the uplands and the Campine, and here, near Maastricht, it includes the small southern prolongation of Dutch territory. Beyond the Maas the fertile belt widens to form the *Plains of the Schelde*, a region drained mainly by that river. In central Belgium this forms a low undulating plateau. In this area, again, sedimentary strata have a covering of loess, and there is intensive agriculture yielding wheat and oats, industrial crops, and roots grown as fodder for considerable numbers of cattle. This type of country extends into France.

Farther north, between the Lys and the sea marsh-lands, the plains of Flanders are less productive by nature; here sandy soils predominate, and arduous toil, involving thorough cultivation and the use of manures, has been necessary to obtain fertility. Cereals are not so widely grown; moreover, rye is in parts more important than wheat. The predominance of rye over wheat is fairly common on the poorer sandy soils of this section of central Europe, for climatic conditions make both crops possible and the determining factors are the dryness and relative infertility of the soil.

On both the Belgian and the French sides of the political

boundary south of the Lys, a rather scattered form of industrial development has persisted from the days when wool was produced, spun and woven in this region. Other forms of textile manufacture have grown up by "transferred inertia," the traditional skill being adapted first to the working of linen and then to that of cotton. Domestic manufacture still continues, sometimes as a necessary supplement to the scanty earnings of agriculture when winter gives spare time, but most of the work is carried on in a number of towns of moderate size situated to the north of the coalfield: in Belgium are Courtrai and Tournai, and in France are Roubaix and Lille; at these last two towns textile and other machinery is made.

By far the greatest city is Brussels, the capital of Belgium, conveniently situated in the centre of the lowland part of the State. It is at the end of the marsh-land of the Senne, a tributary of the Schelde, and grew up at the head of navigation; now it is connected by canals to the coalfields area to the south, and it has become also a centre of railway communication. As the capital of the country, the seat of much financial business, and the site of manufactures of many kinds, it has grown until its conurbation includes a population of nearly a million persons.

The Coalfields.—Fig. 27 shows in a very simplified manner how Coal Measures, formed in the upper part of the Palæozoic rocks, have been worn away from the uplands region but outcrop at the surface where this descends to the lowlands, and are buried at increasing depths under the plains. The coal was mined, therefore, first on the inner margin of the lowlands, and the pits were later extended northwards till the deep working became too costly.

The section might suggest that there is a continuous belt of coal-mining all along the edge of the plains, but the geological structure is actually more complicated and the Coal Measures have not been preserved throughout the border of the lowlands; in consequence the coalfields form a series of disconnected patches. The actual mining areas are shown on the maps on Figs. 30 and 32. The most important of the coalfields is in the neighbourhood of the lower Ruhr where the river leaves the uplands to join the Rhine. Here the Ruhr district has become an intensely industrialized region. The industries, like those of the somewhat similar South Pennine coalfields of England, began in the valleys of the adjoining uplands, where water-power

from the streams was used for an early iron and steel industry which obtained ore and limestone from the uplands and fuel from the forests which clothed their slopes. In some of these valleys geographical inertia has allowed the industries to persist with the aid of the coal from the neighbouring Ruhr field ; thus in the basin of the Wupper, the tributary of the Rhine situated a few miles south of the Ruhr, the towns of Remscheid and Solingen have long been famous for fine steel products, while

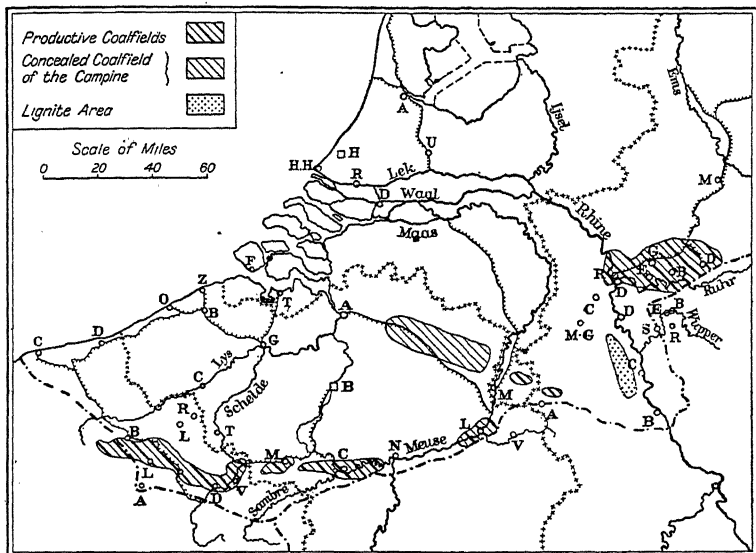


FIG. 32.—COALFIELDS OF THE NORTH SEA LOWLANDS.

a textile industry has persisted, working first wool, and later also cotton and rayon, into many fabrics, notably at Elberfeld and Barmen. These two towns became crowded together into the narrow steep-sided valley of the Wupper above Solingen, and have now been incorporated into one long municipality known as Wuppertal (i.e. Wupperdale) in which nearly half a million people are so packed that the railways have been tunnelled below the houses and elevated above the river and streets.

It is in the plain, however, that the greatest industrial development has occurred. On the Ruhr coalfield a number of towns have grown up, and have so spread that they form an almost unbroken sea of houses north of the river, stretching for about

30 miles eastwards from the Rhine. Where the Ruhr enters the Rhine it is joined by a canal connecting it with the Dortmund-Ems Canal; here a group of river-ports, including Duisburg and Ruhrort, carry on a great traffic in export of coal and import of ore and raw materials, and here are also metallurgical works.

The greatest aggregation of works is at Essen, where, within the municipal boundaries, live two-thirds of a million people, while adjoining it on the east are Gelsenkirchen and Bochum, each of which is about half the size. Several other large towns have sprawled over the coalfield, and the whole region has an unparalleled production of iron and steel goods, among which may be mentioned railway and motor equipment, shipbuilding material, constructional steelwork, and machinery for manufacturing and agriculture. From the coal are obtained coke and by-products, including tars, dyes and other chemicals. Power stations furnish electricity for the grid system, which, fed also from other centres, distributes power to almost all parts of Germany. Textiles, leather goods and many other commodities are produced, while Dortmund is a centre from which great quantities of coal are sent inland by rail.

West of the Cologne embayment, the coal appears again: a little is mined near the German town Aachen, and also in Dutch territory, where an increasing amount is being obtained east of Maastricht.

The Belgian group of coalfields has a large production. The eastern mining area is in the Meuse valley around Liège, the greatest industrial centre of Belgium; the conurbation has a quarter of a million inhabitants and, owing to an early exploitation of ores of zinc, copper and lead, as well as of iron, metallurgical industries are very varied. In a neighbouring valley of the uplands, at and near Verviers, the manufacture of woollen goods has survived.

West of Namur, the line of the Meuse valley is continued by that of the Sambre, and here around Charleroi is another coal basin and metallurgical industry. Farther west the next outcrop of the Coal Measures occurs north of the river near Mons. Like Charleroi, Mons is itself but a small town, and it is characteristic of these western coal areas of Belgium that much of the mining and the associated work is carried on in groups of numerous small settlements set in rural surroundings.

Just across the French frontier is the last of the series of coal-

fields; this stretches in a long and narrow belt from near Valenciennes, past Denain, Douai, Lens and Béthune, until its tip ends beneath the chalk sheet of north-eastern France. As in Belgium, there is no large city, but in and around a string of small towns and villages there is a considerable population engaged in the production of coal, coke and chemicals, steel and machinery. A great deal of coal is sent away, much of it northward to the French industrial area or the ports, and the rest southward by water or rail to Paris and elsewhere.

The belt of coalfields of the North Sea Lowlands may be regarded as a discontinuous tract; it supplies by far the greatest part of the coal-supplies of Germany, France and Belgium, and it includes some of the most densely populated areas of these countries.

Thus, with the coalfields of the inner margin and the ports of the outer margin, the North Sea Lowlands is a sub-region with an economic and political importance scarcely equalled in the world.

QUESTIONS

1. Show how the nature of the coastal areas of the North Sea Lowlands has influenced the manner of life of the inhabitants.

2. Show how the rivers of this region have influenced (*a*) the physical conditions, and (*b*) the economic development.

3. Compare and contrast the situation and the functions of three large ports of this region.

4. Write a reasoned geographical account of the Ruhr industrial area.

5. Describe and account for the differences between the farming of various parts of the North Sea Lowlands.

6. State and explain the main facts of the distribution of population in this region.

7. Briefly state how men have transformed three different types of country in the North Sea Lowlands.

CHAPTER VII

SOUTH-WEST BALTIC LOWLANDS

EAST of the North Sea Lowlands is a region which, because of its position, is different as regards its climate, its surface conditions and its relations with other parts of Europe.

Climate and Vegetation.—As was explained in Chapter II, in summer the temperatures of the lands south of the Baltic Sea are very similar to those south of the North Sea ; but in winter the conditions are more severe. Broadly speaking, the Baltic Lands have a mean January temperature below freezing-point and as one goes eastward still lower temperatures are experienced. As a consequence, the harbours of the Baltic Sea unlike those of the North Sea are normally ice-covered in winter, the period increasing eastwards, e.g. about two months at Stettin (Szczecin) and four months at Kaliningrad ; during this period the ports have to be kept open by ice-breakers.

The gradual eastward change to a continental type of climate is also expressed, though less clearly, in the amount and character of the precipitation ; the annual total decreases, mainly due to a lessened amount in the winter half of the year (compare the figures for Brussels, Berlin and Warszawa in the table on p. 26). Moreover, at this season, with the greater cold the precipitation takes the form of snow, and this commonly remains for weeks upon the ground. Yet the sun is often bright, and clear skies are more often enjoyed in the Baltic regions than in the neighbourhood of the North Sea. Because of the above facts the South-West Baltic Lowlands region is included in the “ Interior Temperate ” climate region.

The natural vegetation shows changes which accord with the shorter period of vegetative growth towards the east. In the region here called the Baltic-Entry Lands the beech is dominant ; from the neighbourhood of Lübeck eastward to the lower Wisła (formerly Vistula) deciduous beech and evergreen coniferous pines form the “ mixed ” forest cover ; from the lower Wisła to the Nemunas (formerly Niemen) pines and spruce are the most common trees, but with them are some beech and oak ;

beyond the Nemunas the length of the winter does not permit the growth of the beech.

The eastern limit of the beech is broadly taken as the boundary of this region, but the precise course of this boundary will be indicated later.

Surface Forms.—The surface conditions of the region are to a large extent determined by the effects of glaciation, e.g. the occurrence of great areas of boulder clay deposited as ground moraine under the ice, broken by great lines of hills formed by the terminal moraines, which have a general east and west direction and are composed of clay, sand and gravel and boulders of all sizes (see Fig. 33).

Beyond the successive margins of the ice-sheet, the water resulting from the melting formed large rivers, which occupied valleys probably existing in some form before the Ice Age; they are known to German and Polish geologists as "primitive valleys." Along these valleys the great ice-water rivers drained westward, deepening and broadening them, and depositing in them masses of sand and gravel. Now that the ice has gone, the valleys are occupied only by smaller rivers coming from the south, and at a number of places these break through the morainic accumulations northward to reach the Baltic Sea, or in the case of the Elbe to reach the North Sea. Hence the primitive valleys have wide expanses of deposit in which there are either relatively small streams or none at all.

Consequently, in the northern part of the region there are three main types of country: (i) In the *Baltic Entry-lands* behind the line of terminal moraine which almost bisects the Jutish Peninsula is a ground-moraine area in which boulder clay predominates. These lands form the region marked (I) in Fig. 33. (ii) Farther east are the *Baltic Plateaus* (marked II), on which varied morainic material is thickly heaped. (iii) South of this belt is that of the *River Lowlands* (III), where the terminal and ground moraines of the earlier stages of the Ice Age were cut by the waters from the ice in the later stages; here the primitive valleys are important elements in the geography.

Finally, in the south, beyond the limits of all but the earliest extension of the ice, and therefore where glaciation has had relatively little effect, the underlying rock formations have a greater influence on the geography; here are the relatively fertile *Interior Plains and Plateaus* (IV). These areas in some

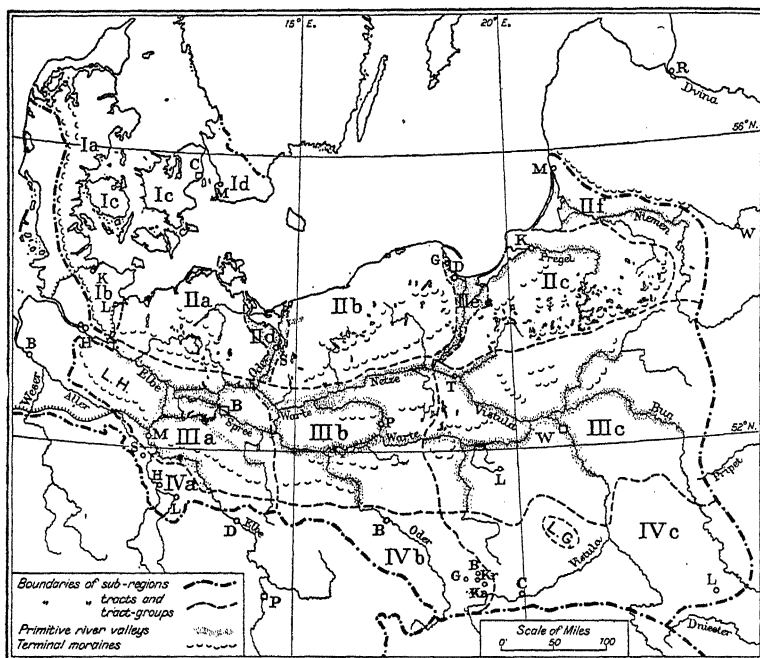


FIG. 33.—REGIONS OF THE SOUTH-WEST BALTIC LOWLANDS.

ways resemble the fertile plains in the south of the North Sea Lowlands. Moreover, adjoining the Central Uplands which form the southern limit of the South-West Baltic Lowlands are some coal deposits, though of less extent than those of the North Sea Lowlands.

The eastern limits of the South-West Baltic Lowlands have been drawn in Fig. 33 as follows: the northern belt of Baltic Plateaus ends where, on the north-eastern side of the lower Niemen valley, a line of terminal moraine (the "Baltic Border-moraine" of Lithuania) marks the beginning of a rather different type of country in the East Baltic area; the River Lowlands belt ends with the basin of the Vistula, beyond which are the Pinsk (Pripyat or Pripet) Marshes of White Russia; the Interior Plains and Plateaus end at the water-parting between the Vistula and the Dnieper, which drains to the Black Sea. Together these boundaries approximate to the eastern limit of the beech, and so correspond with the change to the Sub-boreal climate region.

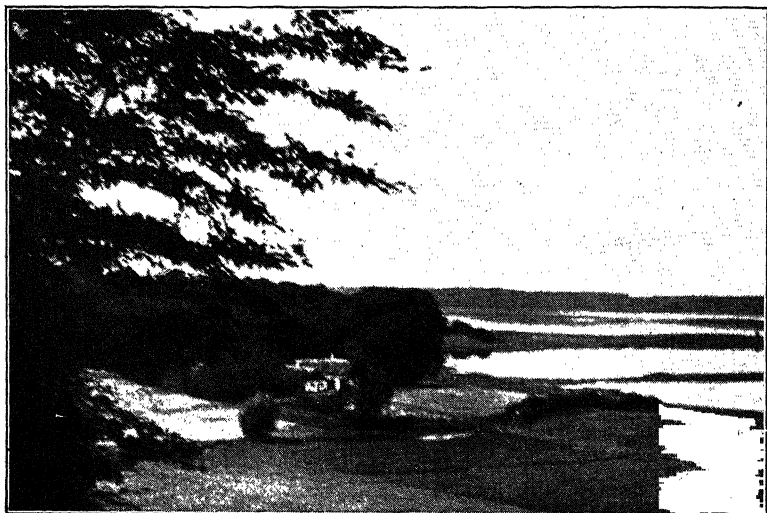
The Baltic Entry-lands.—The terminal moraine which almost bisects the Jutish Peninsula forms a narrow belt of hilly country, a few hundred feet above sea-level, mainly covered with beech and oak trees. Behind this, on the eastern side, the boulder-clay country is low, sloping down to inlets of the Baltic Sea, which represent former glacial lakes, now “drowned” by a slight sinking of the whole area, or by an equivalent rising of the sea-level.

This change of level has also changed earlier river valleys into the three Baltic entries which now separate what was previously one area of almost uniform character; hence the present similarity of all these Baltic Entry-lands, marked I in Fig. 33, including Scania, the extreme southern tip of Scandinavia. Throughout the region beech woods alternate with the fields and meadows. The main aim of the farming is the keeping of cattle, pigs and poultry, and the consequent production and export of butter, bacon and eggs. The land is therefore utilized mainly for obtaining grain, roots, clover, grass and hay for the animals and to a much smaller extent for growing crops for human use, especially barley, oats and beet; closely associated with the agricultural production and keeping of animals are small industries of making sugar, brewing beer and dressing leather.

Along the north coast of Jutland the sand-dunes have been drifted as far as the point Skagens Horn, and the northern part of the peninsula is in parts sandy rather than clayey, but apart from this there is much similarity throughout the Baltic Entry-lands. Scania (Id) differs very markedly from the rest of Scandinavia, fundamentally because along its north-eastern boundary are a series of faults which have let down and preserved sedimentary rocks on the south-western side, while crystalline rocks of the Baltic Shield form most of the country on the north-eastern side. How this has influenced the farming is shown by the fact that on the south-western side 80 per cent. of the land is cultivated, while the proportion on the north-eastern side is less than 30 per cent.; a population map shows a correspondingly sharp contrast. Climatic factors, too, play some part in bringing about the difference, for southern Scandinavia as a whole has the Sub-boreal type of climate, but in Scania the beech can thrive.

In addition to relatively favourable conditions of climate and soil, the Baltic Entry-lands, as the name implies, have a favour-

able commercial situation. This was more important in the past before railways, good roads, and canals diverted traffic from the seas, but there are still several ports at the eastern end of the Baltic. In the German part of the region (marked Ib), Lübeck is an "old-world" town, once the chief seat of the Hanseatic League dominating the trade of the Baltic lands; there is also Kiel which has grown as a port at the end of the North-Baltic Sea Canal. On the Danish portion of the Jutish



[Danish Tourist Bureau.]

FIG. 34.—VIEW ON THE ISLAND OF FÜNEN.

Note.—The ground-moraine landscapes of Eastern Jutland and the Danish Islands have numerous low rises and small hollows, many of the latter being occupied by lakes or ponds; by the coasts the "drowning" has converted these into small inlets. As in this view, the farms are commonly set among pastures and beech-woods; in the foreground the foliage of a beech tree can be recognized.

Peninsula (marked Ia), there are only smaller ports, but on Zealand, the largest of the islands (marked Ic), is Copenhagen. It is situated on the Sound, the shortest route between the Kattegat and the Baltic, though its growth to a great city of more than three-quarters of a million inhabitants is due largely to the fact that it is the capital of Denmark. In Scania, Malmö is connected by train-ferry with Copenhagen; it is the chief port of this part of Sweden, and in size is the third town of that State.

The Baltic Plateaus.—East of Lübeck, the Baltic coastlands become on the whole higher and form a series of plateaus

sometimes known as the Baltic Heights, which alternate with low, broad valleys. The Mecklenburg plateau (IIa) is succeeded by the Oder valley, that marked (IIb) overlooking Gdansk (Danzig) by the Vistula (Wisła) valley, and that in north-east Poland (IIc) by the R. Nemunas (Niemen). The highest parts of each plateau are covered by terminal moraines, rising to several hundreds of feet. These are to a considerable degree wooded, but as a legacy of the ice the drainage is in general poor, marshy areas abound and there are so many lakes that the regions are often referred to as the "lake plateaus." On the northern slopes, boulder-clay areas provide better soils, and agriculture yields crops of rye and potatoes, but the productivity is never high and decreases towards the east. On the southern slopes, outwash sands from the ice form but poor soils, and woods and pastures give a living to a scanty population. The low river valleys are naturally marshy and liable to flood, but where the alluvial plains are protected by dykes there is fertile ground, on which cereals, sugar-beet and other crops are grown, and animals are pastured.

The coasts vary in conformity with the lands behind them. Projecting from the Mecklenburg plateau are islands with low cliffs, as on Rügen, and parts of the coasts of the other plateaus are also cliff-edged. The valleys end in funnel-shaped estuaries in which the rivers have built deltas; sand drifted from the west has formed spits which almost shut in lagoons and, where the coast faces west, there are high sand-dunes.

These river and sea deposits hamper navigation, which also suffers from the formation of ice in winter, but ports have grown up at the mouths of the largest rivers. By the Oder is Szczecin (Stettin), now important as the outlet of the productive westernmost part of Poland.

At the end of the Vistula valley are two ports: Gdansk was once a German settlement which, situated by an old mouth of the river, has for centuries been the outlet for the trade of the Vistula basin; Gdynia, away from the river itself, was constructed to give Poland an independent port at the end of the "Polish Corridor" which reached the sea during the period between the First and Second World Wars (see Fig. 26).

At the mouth of the River Pregel is Kaliningrad, another old German city; its development was in part due to trade from Russia, which came here in preference to the more easterly

ports because of the shorter time during which ice prevented navigation.

The R. Nemunas (Niemen) is in Lithunania ; its port is Klaipeda (Memel) and higher up is Kaunas where it is joined by a tributary on which stands the capital, Vilnius.

The River Lowlands.—Not all this region marked III is low, for there are lines of terminal moraine forming belts of hilly country ; these are, however, neither so high nor so wooded as those farther north, and frequently form heath-land, e.g. the Lüneberg Heath west of the Elbe (marked L.H. in Fig. 33). More extensive are the areas of ground moraine, generally covered by a relatively fertile loamy soil, on which corn, especially rye, sugar-beet and potatoes are grown.

The characteristic areas of the region, however, are the broad, glaciated valleys. One series is just within the northern boundary of the region ; with the aid of canals it connects the Vistula above Torun with the Notec (Netze) and Warta (Warte) tributaries of the Oder, and that river with the lower Elbe. The second important line of valleys runs along the middle of the region ; it joins the Bug tributary of the Vistula to the upper Warta, and this river by the Spree to the Elbe. The Elbe above Magdeburg flows in another glacial valley, but below the town the river breaks off to the north ; its earlier valley is continued westward towards the Aller and is occupied by the Mittelland Canal.

These and other glacial valleys have facilitated water communication, but they did not easily lend themselves to other use, for they are partly marshy and the natural vegetation-cover is commonly heath on the drier sands and dense thicket in the damper parts. But now considerable areas have been drained and dyked and transformed into fields and meadows.

Of the three areas comprising this River Lowlands region, that drained by the Elbe (marked IIIa) is particularly important because Berlin has grown up within it. The rulers of the district around Berlin, the " Mark," during several centuries increased their power until they became Kings of Prussia and, at last, Emperors of Germany ; Berlin was the seat of their Government and developed with the growth of the State. Its position in the centre of the waterways is shown on the map, and when railways were constructed they were made to centre upon the city. Its development as an administrative and com-

mercial metropolis aided the establishment of many forms of industry, until it became the largest manufacturing city of Germany; also a centre of many professions and education. Consequently it spread over 800 sq. miles and had over 4 million inhabitants. But as a result of the Second World War it declined greatly and its present condition is described in Part III of this book. Magdeburg is a large town which owes its growth mainly to its position on the Elbe.

The Oder Lowland (IIIb), has been less developed than the Elbe Lowland; it is a rather sparsely populated rural region, and has smaller towns. The most considerable of these is Poznan, formerly known by its German name, Posen.

In the Vistula Lowland (IIIc), with which part of the upper basin of the Warta is here included, the terminal moraines are less developed, and in addition to the wet river valleys, even the areas of ground moraine have large marshy spaces. There are other districts of woods and heaths, and in general the amount of cultivated land is less than in the more westerly lowlands. In the centre and on the Vistula is Warszawa, the capital of Poland, with about a million people. For some decades Russian and then Polish Governments aided manufacturing in this region by customs barriers. Consequently, industries which here lack any special natural advantages are carried on in several towns, including Warszawa and the large manufacturing city of Lodz, which has about a million inhabitants; cotton and other textiles, metals and machinery, and chemicals are made. (See industrial map of East Central Europe, pp. 364 and 365.)

The Interior Plains and Plateaus.—It has already been suggested that this most southerly belt of the South-West Baltic Lowlands, with its less-marked glaciation and its greater fertility, may be compared with the "Fertile Plains" belt of the North Sea Lowlands.

This is certainly true of the area which is drained to the Elbe, and may be called the *Leipzig or Saxon embayment* (IVa), for it resembles the Cologne embayment in several respects. The sedimentary rocks are covered with loess in the southern part, and the region as a whole has intensive agriculture, in which the growing of industrial crops is important. Moreover, there are great deposits of lignite, extending from near Magdeburg southwards past Stassfurt, Halle and Leipzig, which supply power for local industries. These industries are aided, too, by

the occurrence of common and potassium salts in the districts adjoining Stassfurt and Halle, where there are great chemical works. At Leipzig there are varied manufactures which have grouped themselves around an older commercial settlement ; this grew up because here an ancient east-west route avoiding the Saxon Uplands found a convenient crossing-place in the otherwise marshy valley of the River Elster, by which Leipzig stands. The city is also noted as a centre of printing and publishing. It has become one of the most important railway junctions of central Europe, and its population is now about three-quarters of a million people.

Farther east, the broad upper valley of the Oder forms the *Silesian Embayment* (IVb). While the south-eastern part of this hollow is covered with sandy and rather infertile glacial deposits, the lower north-western part has more clay and loess or loamy soils on which industrial and other crops are grown. Where the Oder is crossed by old land-routes is Wroclaw (Breslau) with nearly half a million people ; with coal and iron near-by it has electrical, textile and leather industries. (See map on pp. 364 and 365.)

At the south-eastern end is the Upper Silesian coal basin, of which part is in the Oder valley, and part drains to the Vistula. Coal is not actually mined in all parts of the basin, but iron, zinc and lead deposits are worked in the area ; as a consequence there are considerable metallurgical industries. The greater part of the coal-bearing area is now in Poland, including the towns Katowice, Chorzow (Krolewska Huta), Gliwice, and Bytom. With smaller settlements, there is a large population engaged in engineering, chemical and other industries. A smaller part of the coalfield is in Czechoslovakia ; it includes Moravska Ostrava and Tesin (Teschen) where similar occupations are important. The boundary between the States cuts across a network of communications serving the mines and factories of the region.

The South Polish Plateaus.—This region (IVc), mainly drained by the Vistula, rises from the River Lowlands southward to the Carpathian Mountains. As a whole, it consists of a number of plateau-like areas, but the upper courses of the Vistula and its tributary, the San, flow through lower country, while north of this upper Vistula valley the land rises in the Lysa Gora (marked L.G.) to a height of almost 2,000 feet. This variety in the relief

corresponds to a variety in structure, for the greater part of the region is formed of limestones and other sedimentary strata of Secondary or Tertiary age, much dissected by the rivers, but faulting of the earth's crust has resulted in the emergence of blocks of more ancient and more resistant rock in the Lysa Gora area. Surface conditions, too, vary considerably, for in parts glacial deposits cover the sedimentary strata, while in some areas, especially in the southern part, there is a thick mantle of loess in which streams have cut cañon-like valleys.

With the variation in relief and soils, the fertility and the utilization of the land vary, but in general it is an agricultural region suited to the growth of grains and industrial crops, and noteworthy, as compared with the more northerly Baltic lands, for a relative importance of wheat production. The southern portion of this region forms part of Galicia, which extends also into the Carpathian Mountain region, and the famous salt-mines of Galicia are at Wieliczka, near Krakow (Cracow).

Krakow is situated where the Vistula was crossed by an old route following the northern side of the Carpathians, and another old commercial centre, with a somewhat similar position is Lvov, formerly Lemberg. This latter city, however, is unusual in being situated on no large river; it is on the water-parting between the streams draining to the Baltic on the one hand and to the Black Sea on the other. Near the meeting-point of several natural regions, it was at the focus of roads which exchanged different products. After the Second World War Lvov and the surrounding area were yielded by Poland to the Ukraine.

In this neighbourhood we reach the limit of Temperate Europe, and therefore return to deal with the lands situated on the Atlantic side of the North Sea Lowlands.

QUESTIONS

1. Compare and contrast the south-west coasts of the Baltic Sea with the south-east coasts of the North Sea.
2. Show how the glaciation of the South-West Baltic Lowlands has influenced land-utilization in that region.
3. Give an account of the inland navigation system of North Germany, with reference to physical conditions and economic developments.
4. Write a systematic account of the geography of Denmark, relating the facts as closely as possible.

CHAPTER VIII

NORTHERN FRANCE

The North French Lowland.—West of the North Sea Lowlands rises a belt of chalk country which reaches the Strait of Dover in Cap Blanc Nez, the counterpart of the cliffs of Dover. From this cape southward to the Central Plateau of France, and extending from the Central Uplands of Europe in the east to the Breton Peninsula in the west, is the North French Lowland (see Fig. 35). In its build this sub-region resembles the English Lowland: it is formed in the main of low plateaus, which are cut by river valleys, are sometimes edged by escarpments and sink in parts to low basins or marshy plains.

From the geological point of view, the North French Lowland occupies a great hollow known to geologists as the Paris Basin. Within the hollow the land is composed of strata lying one above another upon a platform of ancient rock which rises in the east to form the Ardenne and other parts of the Central Uplands of Europe, and in the west to form the Breton Peninsula, while on the southern side it is upthrust in the Central Plateau (see the section in Fig. 38, and note that the succession of the strata is set out in Appendix I). Broadly speaking, the lower sedimentary layers outcrop near the margins of the basin, while the uppermost ones appear in the central part.

The strata of the North French Lowland, like those of the English Lowland, differ markedly from one another in their composition, and thus give rise to differences in the relief, in the soils and in the utilization of the land; hence the structure largely determines the varying conditions within the region.

The North French Lowland has a more southerly and a more continental position than the English Lowland, and consequently its summers are warmer and its winters rather colder, as may be seen by comparing the temperature figures for Paris and London in the table on p. 26. There is not much difference in this respect between the districts near the two sides of the Channel, but in the more southerly part of the French region the greater heat in summer becomes more marked and makes pos-

sible the growth of plants, particularly the vine, which cannot ripen their fruit under normal conditions in England. Such differences, allied to traditional differences between the English and French people in the modes of cultivation, lead to considerable contrasts in the appearance of the landscapes and the mode of life of the population in the two countries.

The Ile de France.—The central part of the North French Lowland (marked I in Fig. 35) lies around the capital, Paris, towards which the streams draining the area converge. Here, in past centuries, was the heart of what was then the Kingdom of France, its eastern side being protected by a cliff-like line of escarpments¹ which raised it, island-like, above the surrounding lowland; hence this central region became known as the "Ile de France."

It is a group of tracts consisting of gently inclined table-lands, rising in the eastern escarpments to about 800 feet above sea-level, and in parts deeply cut by the valleys of the Seine and its tributaries.

The strata of which the Ile de France is formed differ in composition, and as they are slightly tilted, they outcrop in various parts of the region and hence lead to differences which mark out the respective tracts. For example, south-west of the Seine is Beauce, which has characteristic features due to the subsoil being a layer of permeable limestone; the country is a flat, monotonous and rather dry plateau, though a thin, loamy soil allows cultivation of great quantities of wheat. Usually water can be obtained only by boring deep wells; these are therefore costly and not numerous, and around them the farm-houses are grouped in large villages, whence the treeless fields of the whole community spread out to considerable distances.

Between the Seine and the Marne is situated another wide and generally level tract, Brie, where the subsoil consists of a lower sheet of limestone of a siliceous, "millstone" type and includes clay, which prevents downward drainage. Consequently the surface is often wet, there are groups of trees, and the characteristic occupation is the keeping of cattle and the production of milk and cheese; with no difficulty in obtaining water, the farms are conveniently situated within their fields and the population is of the dispersed type.

¹ These escarpments, and also geological faults in other parts of France, are shown in Fig. 36 by symbols which are explained on the map in Fig. 44.

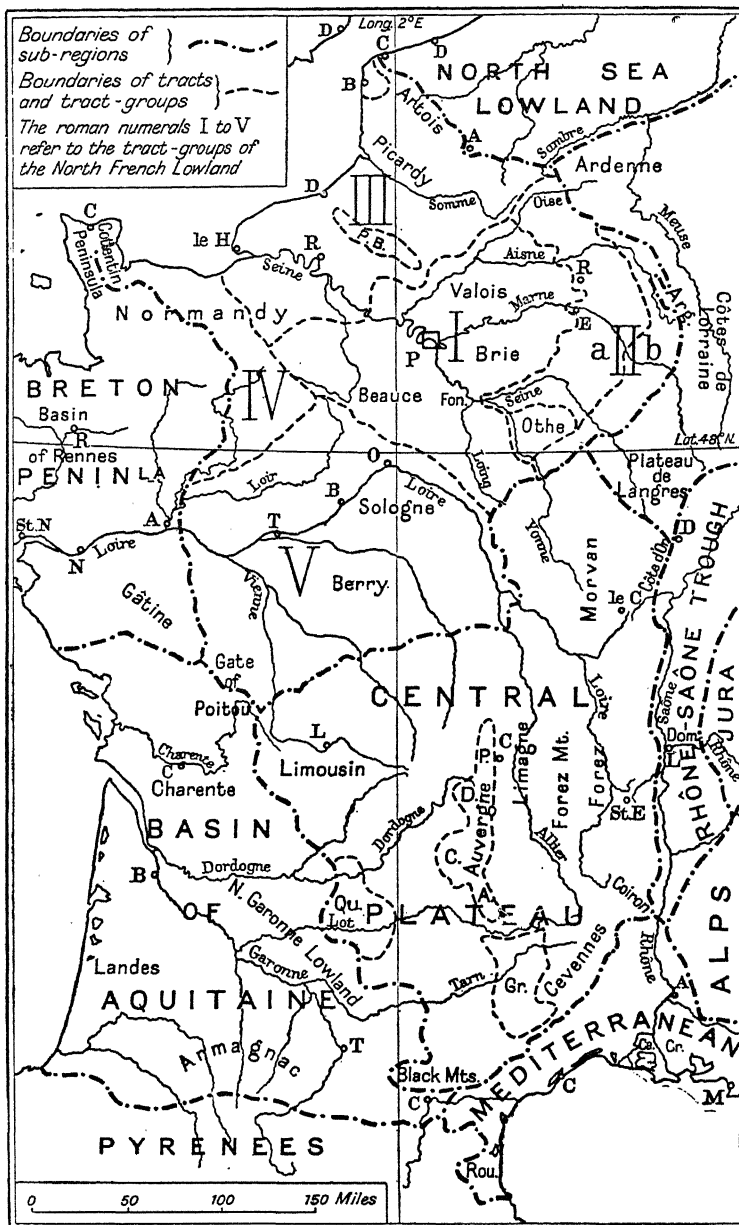


FIG. 35.—REGIONS OF CENTRAL FRANCE.

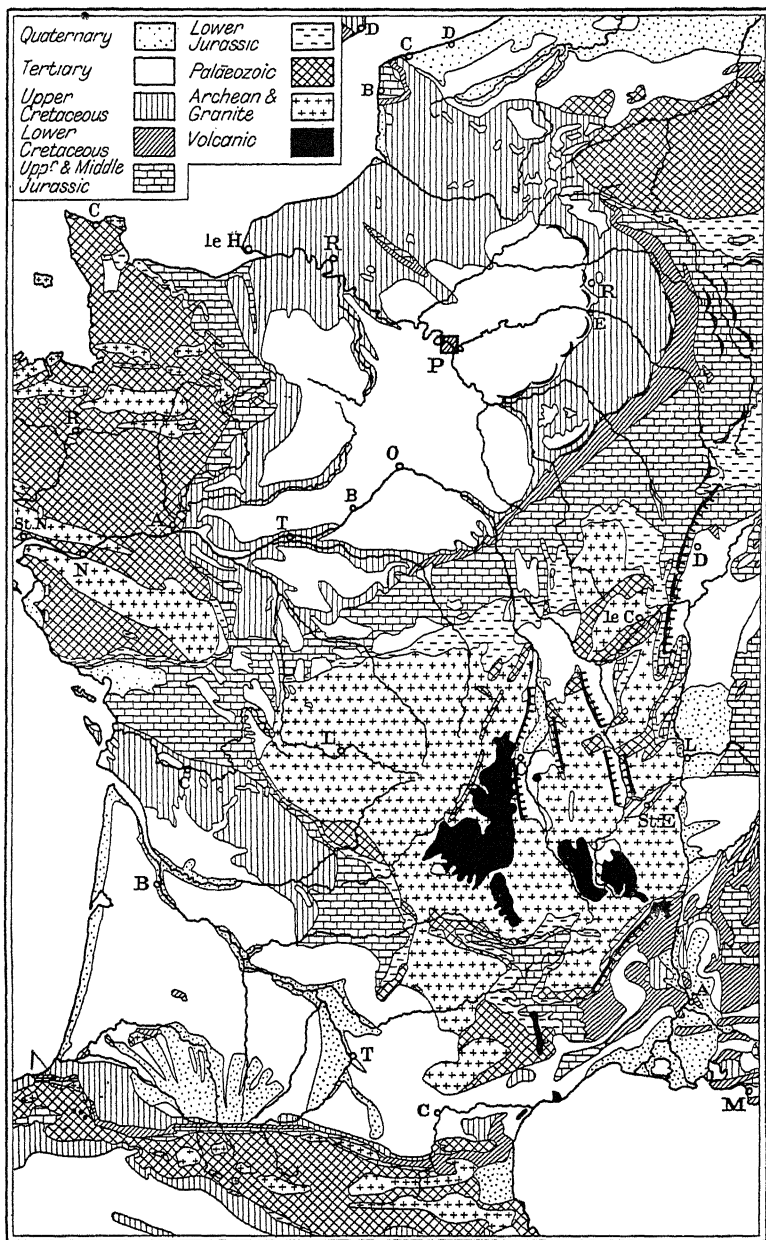


FIG. 36.—STRUCTURE OF CENTRAL FRANCE.

Between the Marne and the Oise is another tract, Valois, distinguished by the occurrence of a still lower stratum of limestone, generally covered with a fertile loam, but there are also patches of sand on which are woods. Elsewhere, too, in the Ile de France wooded, sandy or clayey layers outcrop ; e.g. the forest of Fontainebleau (Fon.) is on a sandy stratum situated between the limestones of Beauce and Brie.

The plateaus are separated by broad and often marshy



FIG. 37.—VIEW IN PARIS.

"Yvon," Paris.

Note.—The photograph was taken looking up-stream to the island in the Seine, the "Ile de la Cité," the nucleus of Paris ; on the island are to be seen the towers of Notre-Dame. The view shows the shorter bridges spanning the Seine on either side of the island as compared with that across the undivided river ; below this bridge are a few of the many barges which load and unload on the quays of Paris.

valleys, and in that of the Seine Paris grew up at a site where an island facilitated the bridging of the river. The position of Paris ensured its future importance : a north-south route here crossed another leading from east to west down the Marne and the lower Seine ; further, its central situation in the Ile de France early made it the natural seat of the kings of France, and with the development of the French territory it became the capital of the modern State.

As the seat of the Government and at a meeting-place of routes, it became a trading and residential centre, to which new roads were made and railways were built from all parts of France,

and indeed from all western Europe. Also, the River Seine is navigable between the sea and the capital, and from the neighbourhood of Paris canals now complete the natural communications of its tributaries: the Oise is joined to the North Sea Lowlands, the Marne to the Rhine valley, the Yonne to the Saône valley, and the Loing to the Loire valley. With this increase in its commercial significance and with the accompanying growth of its population, Paris was in a most favourable position for manufacturing and for the production of goods of almost all kinds; it is famous for articles of clothing or adornment for which skill and artistic taste are required. Paris is the artistic and intellectual, as well as the political, capital of France, and its great treasury of art, the Louvre, draws visitors from all parts of the world.

Paris now has a population of nearly three million persons, while the whole conurbation of which it is the centre has spread along the neighbouring valleys and on the adjoining plateau areas, absorbing many outlying towns, until the total population exceeds four millions.

The east-facing escarpment of the Ile de France has a peculiar importance, for on its lower slopes limestones with a covering of vegetable humus provide a suitable soil for the vine, and where there is a favourable exposure are the famous vineyards from which champagne wine is obtained. Also the Marne has here cut through the escarpment and formed a wide valley, into the opening of which the champagne vineyards extend. At this opening is the town of Epernay, and some miles to the north, at the foot of the escarpment, is Reims (Rheims); these two towns are the great wine centres of the district. At the base of the escarpment of Tertiary rocks, the chalk of the Upper Cretaceous comes to the surface, and at and near Epernay and Reims it has been hollowed out into great labyrinths of caverns; here, where the underground temperatures remain even, the wine is matured.

The "Dry" and "Wet" Champagne Regions.—The term champagne as applied to wine comes from the name of the old French province, which included this vine-growing area. The province, however, extended far to the east, where it comprised the greater part of two markedly contrasted geographical regions; these have long borne the names Champagne pouilleuse and Champagne humide, indicating the beggarly and dry nature of the one and the wet condition of the other.

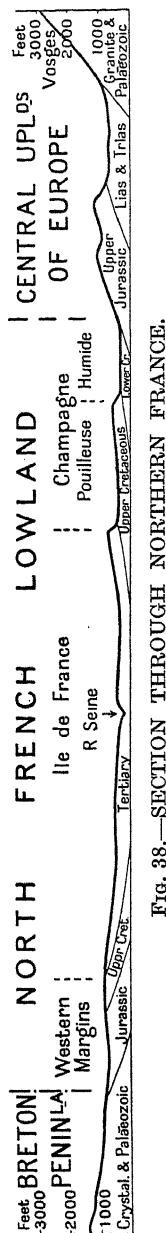


Fig. 38.—SECTION THROUGH NORTHERN FRANCE.

The contrast is due directly to the Secondary strata which rise from below the Tertiary escarpment of the Ile de France (see the section in Fig. 38). Immediately to the east the Upper Cretaceous chalk comes to the surface, forming at first a low belt of country, but then rising to the bare plateau of the "Dry" Champagne (IIa in Fig. 35); here there is little cultivation, and poor pasture lands on which sheep feed are the chief resource of a small and scattered population. At the northern and southern ends of this chalk plateau, coverings of Tertiary deposits give rise to more wooded landscapes; the southern area, that within the great westerly bend of the Seine, is the Forest of Othe.

Eastwards the chalk forms an escarpment, beneath which outcrop the Lower Cretaceous clays to which the character of the "Wet" Champagne (IIb) is due. Although naturally forested and marshy, when drained its soils are capable of producing crops and rich pastures, and now it is a tract of agriculture and cattle rearing. This low Champagne region is bounded eastward by the wooded heights of the Argonne (Arg.) and by the more gradually rising uplands of the Côtes de Lorraine; these may be regarded as the beginning of the Central Uplands of Europe.

The Channel Plateaus.—From beneath the Tertiary layers of the Ile de France, the chalk emerges northward to form a series of plateaus (III in Fig. 35); these extend to the coast of the Channel, largely in the form of low cliffs, though where the coast faces westward between Dieppe and Boulogne the westerly winds have built up sand-dunes.

At the north-eastern end the chalk is bent up into the "swell" of Artois, which is a lower continuation of the Wealden Uplift of south-eastern England. Adjoining the channel the anticline is sufficiently great for the chalk top to be worn off,

as it has been in the Weald ; the underlying strata, among which is a good deal of clay, have been exposed and worn down into a lower area around Boulogne known as the Bas Boulonnais. This low country is a relatively wet, cattle-rearing district, while the surrounding chalk regions of the Haut Boulonnais and the hilly Artois are drier.

This Artois plateau is not, however, poor country like the Champagne pouilleuse, for the chalk is largely covered by deposits of loam or loess with a fertile soil producing much wheat, fodder crops such as clover, colza, from which oil is obtained, and beetroot ; after the harvests sheep are turned out to graze on the fields. Continuing the Artois tract to the south-west is Picardy, essentially similar in character ; here the folds of the chalk, almost parallel to that of the Wealden-Artois anticline, give rise to an undulating country with the trends running south-east to north-west, and in the same direction the rivers drain to the Channel, the largest being the Somme. On the south-western border of Picardy, one of the anticlines is so marked that the chalk top has been worn away, and the resultant long and narrow Pays de Bray (" P.B." on the map) is a relatively low tract much like the Bas Boulonnais.

South-west of the Pays de Bray the chalk appears again in the low plateaus of Normandy ; much of it is covered with " clay with flints," or, south of the lower Seine, with Tertiary deposits, often loamy in composition. While the plateau areas show much open cultivated country, the valleys have more trees and pasture ; as a whole, Normandy is a province of varied productions and varied relief. The most marked features of the relief are seen in the valley of the Seine ; here the river has been incised deeply into the plateau.

Near the head of the tide on the Seine is Rouen, and here is much interchange of goods from sea-going vessels to inland barges ; here, too, was the lowest bridge-place on the river. Now Rouen imports much of the coal and oil which France needs. In and around the city are many factories in which cotton and other textiles are manufactured, while there are also other industries in the neighbourhood ; Rouen is consequently one of the larger cities of France.

The coasts of the North French Lowland are on the whole not such as to facilitate maritime activities, but the easy crossing to England has given rise to the ferry ports of Boulogne, which

is also an important landing-place for fish, Dieppe and le Havre. The foreign trade of le Havre is very considerable; it is the outport of Paris and Rouen, specially constructed to accommodate the large vessels which cannot proceed up the Seine; it imports the cotton for Rouen and the other manufacturing towns of North France, and through it passes much of the foreign produce needed for Paris and for the North French Lowland in general.

In the *Western Margins* of the North French Lowland (marked IV), there is a gradual change to a more diversified region. Here the Cretaceous and Jurassic strata which rise to the surface are not so thick nor have they the same clearly contrasting characteristics as in the east, though limestones, sandstones and clay still bring variety to the country; the strata, however, rise in parts to greater elevations than are found elsewhere in the North French Lowland. Near the coast is the dry limestone plateau of Caen; elsewhere fields alternate with heaths and woods, and the general appearance of the landscape suggests a transition to the adjoining Breton Peninsula.

The Middle Loire Basin.—The River Loire, between its exit from the Central Plateau and its lower course across the region of the Breton Peninsula, traverses and drains a broad and generally low area which continues the structure of the North French Lowland. This Middle Loire Basin is marked V on the regional map.

Here are all the strata found elsewhere in the North French Lowland region, but they are generally thinner and have narrower outcrops, and also they have been less upraised than in the more northern parts of France; consequently they do not form wide plateaus, nor have they been etched out into such marked escarpments. Moreover, the Middle Loire Basin includes in the south a part of the belt of Jurassic limestones which, farther east, have been raised to form part of the north-eastern projection of the Central Plateau and also the Côtes de Lorraine (compare the regional and geological maps). Here in the Middle Loire Basin, on the western side of the Loire, the belt is lower and the limestones form the dry plains of Berry.

Although there are not marked differences in the relief of the Middle Loire Basin, its varied structure expresses itself in a diversity of scenery and productions, so that it is difficult to give a short summary of the characteristics of the region from

these points of view. But the generally low altitude and the more southerly situation of this part of the North French Lowland result in relatively high summer temperatures, and of these the people have taken advantage to grow great quantities of vines in the valley of the Loire and its southern tributaries.

Agriculture is the predominant occupation of the region, which as a whole is of moderate fertility. Cereals, especially wheat, are the main product ; in addition, fodder for animals is grown, for on the better watered areas cattle are largely kept and sheep in drier parts, such as the open lands of Berry and also in the Sologne, once marshy but now drained.

In past centuries the basin of the Loire was relatively a more important part of France than it is at present ; Orleans at the nearest point to Paris served as a link between the metropolitan region and the centre of France, and from Orleans down the valley there is still to be seen a succession of finely built castles, e.g. at Blois, Tours, Saumur and Angers.

At its south-western end the basin of the Middle Loire narrows to the Gate of Poitou, which leads to south-western France.

The Breton Peninsula.—By comparison with the broad open fields of the North French Lowland, the Breton Peninsula is shady country, with small fields enclosed by hedges and with a good deal of tree growth. The distinction is largely due to the irregular relief of the land and to the abundant surface water, and these characters are themselves the result of the occurrence of older and impermeable rock and the heavier rainfall of the region. Hence the boundary between the North French Lowland and the Breton Peninsula is drawn where the impermeable rocks of Palæozoic and Archæan age emerge from beneath the sedimentary strata already described, and project westward between the Channel to the north and the Bay of Biscay to the south. Since the greater part of this area formed the old province of Brittany, the name Breton Peninsula is here used, although the region includes the western part of others of the old provinces, notably Normandy and Maine. The peninsular position of the region gives it the equable and rainy climate which marks it out as part of the Atlantic Margins minor region of Temperate Europe. The contrast between the conditions at Brest and at Paris are shown by the figures on p. 26.

Moreover, the structure of the Breton Peninsula, one of the " Hercynian " uplands, distinguishes it from the neighbouring

regions of France and, together with the climate, makes it resemble the Devonian Peninsula of England in many respects.

The plateau was raised a relatively little distance above sea-level, and rivers have etched out the less resistant rocks, leaving the more resistant ones as ridges or bosses of moderate height. The direction of these elevations corresponds with that of the old mountain systems: in the north from west to east, and in the south a tendency to the south-east; consequently the present triangular-shaped region shows, at the Atlantic corner, parallel ranges near the north and south coasts with a narrow low belt between them, while on the continental side of the triangle there is a broader northern upland area forming the heights of Normandy and Maine, then a wide lowland through which the Loire enters the sea, and in the south the Gâtine upland trending south-eastward before it disappears under the Gate of Poitou.

Uplands versus Lowlands.—The structure is the main cause of the differences between the uplands and the lowlands of the Breton Peninsula—one of the three great contrasts which the region offers to the observer.

The uplands, both those near the western extremity and those near the eastern margin, reach 1,000 feet and more above sea-level; frequently they are in the form of long ridges composed of Archæan crystalline rocks, such as gneiss or quartzites, or of resistant sandstones; in other cases they are broader and more rounded in form and composed of granite. On these rocks poor stony soils have developed, and the wind-swept, rainy uplands generally bear a heath-land type of vegetation; in parts water collects in the hollows of the impermeable rocks and forms pools, while marsh plants grow in a peaty soil.

Between the uplands the lowlands have been worn down in the less-resistant slates or shales; here clayey soils have been formed, and though naturally ill-drained and wet and once densely forested with oaks, they have proved capable of utilization. There are meadows on which many cattle are reared, largely for the production of milk and butter; there are fields in which cereals and vegetables, especially potatoes, are grown; there are orchards from which large amounts of apples are obtained, and in this part of France cider made from the apples takes the place of wine. The most extensive lowland area is the "Basin of Rennes," in the centre of the region, situated between

the generally higher elevations of the western extremity and the eastern margins.

The mineral resources of the region are very small, and apart from some iron in the north-east margin in Normandy, the chief products are granites and slates, quarried where they can be transported easily by water.

East versus West.—Because of the triangular shape of the Breton Peninsula, the narrow and projecting west is much more exposed to the influence of the sea than the broader east which adjoins the North French Lowland; the former is wetter and more wind-swept, although more equable, while the latter has warmer and drier summers. Moreover, there is a greater extent of the clayey areas in the centre and east, and consequently the more valuable crops of wheat and oats are obtained in these parts, while buckwheat and rye are grown in the west.

Because of its remoteness from the rest of France, the people of the west have been more isolated, and this feature of their lives is increased by the method of farming: the peasants mostly live in scattered houses, surrounded by their patches of arable land, pasture, and vegetable and fruit garden, enclosed by hedges and trees, and connected with the outer world only by a muddy cart-track. Old ways and old ideas tend to persist, and Breton is still widely spoken.

Coast versus Interior.—The Celtic word “Armor” meant the coastal belt, in opposition to “Archoat,” the wooded country of the interior, and the life of the region has been greatly affected by the character of the coast itself.

The breaking up of the old massif led to the broad outlines of the present peninsula, but the numerous bays of moderate size are due to more recent changes of sea-level, involving the “drowning” of the earlier valleys; in the far west the hollow between the northern and southern ridges has been deeply invaded by the sea, and the great bays of Brest and Douarnenez are the result. This irregularity of the coast has been accentuated by the wearing action of the stormy seas, which have fretted the shores, wearing them back into cliffs and detaching the outstanding parts of headlands to form rocky islets.

Such a coast, although at times dangerous to shipping, gives abundant harbourage, and fishing and trading have been encouraged. From the north coast fishermen go as far away as the Newfoundland and Iceland cod fisheries, and on the south

CHAPTER IX

SOUTHERN AND CENTRAL FRANCE

The Aquitaine Basin.—The latitude of south-western France accounts for its higher temperatures both in summer and in winter, as compared with those of the Paris region (see the figures for Bordeaux on p. 26), and the direct exposure to the Atlantic winds accounts for heavier rainfall. These conditions make possible a widespread cultivation of maize, which becomes more important than wheat as a cereal crop in the south, and there is a wider extension of vine-growing in the Aquitaine Basin even than in the Middle Loire Basin. On the adjoining Central Plateau and the Pyrenees fall heavy rains, and from these the rivers bring down great quantities of water, particularly to the Garonne, which is in consequence subject to great floods. Moreover, the bottom of the great trough between the two highland areas has been largely filled in with material brought down in the past, and alluvium is still being deposited in the valley of the Garonne and is rapidly filling up the Gironde, the common estuary of the Garonne and the Dordogne. The Garonne is not navigable above Bordeaux, except for small boats, and large liners have to use outports near the mouth of the Gironde if they serve this region at all.

Indeed, in spite of the long coast-line, the natural conditions do not favour maritime activities, for in this angle of the Bay of Biscay the currents sweeping southward have accumulated sand, which has been heaped up by the prevailing westerly winds into an almost continuous belt of high dunes. These are known as the *Great Dunes of Gascony* and are shown on the geological map as among the Quaternary deposits. The belt of sand has enclosed a number of lagoons, all except one now being completely shut off from the sea.

Moreover, behind these coastal barriers is the tract of the *Landes*, consisting of great flat plains of wind-blown sand, below the surface of which iron has cemented the sand into an impermeable pan. The region was therefore a marshy heath-land with innumerable pools; in these, mosquitoes bred and carried

malaria among the few people who kept sheep on poor pastures.

Now, however, the inland drift of the sand has been checked by planting grasses and trees on the dunes, and the drainage has been improved by breaking through the pan and by cutting dykes; then, some thousands of square miles were planted with

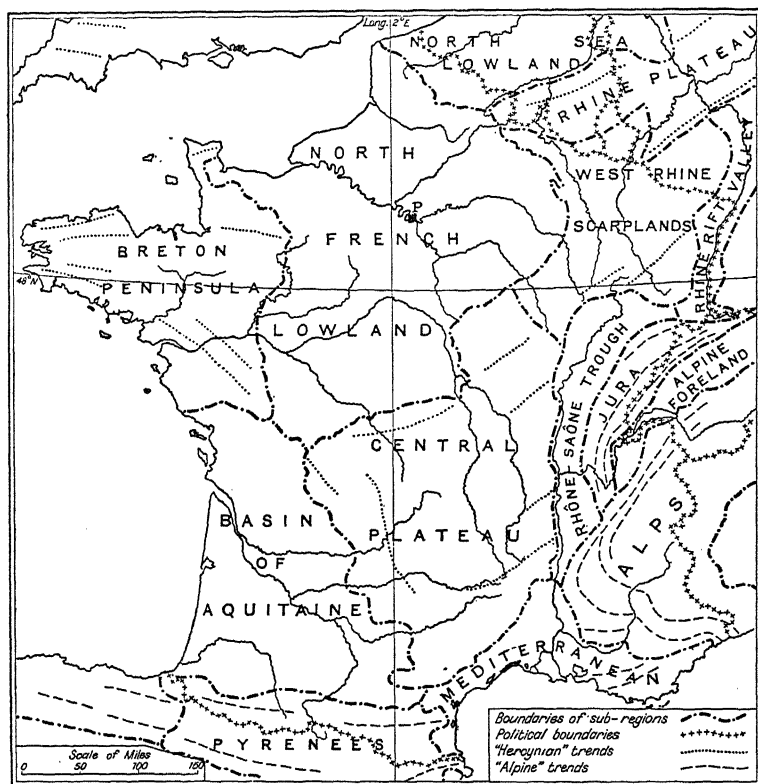


FIG. 39.—REGIONS AND STRUCTURAL TRENDS OF FRANCE.

the maritime pine, which yields timber, resin and turpentine, while improvements in pasturing have allowed many more sheep and also cattle to be reared on the Landes.

The other tracts of the Aquitaine Basin are much more productive. The country which adjoins the Gate of Poitou is called the *Charente Region*, for it is drained by the River Charente to the Bay of Biscay. The soils are fertile, producing

wheat and maize, and along the whole course of the middle and lower Charente there are vineyards ; from the wine a great deal of brandy is obtained—a famous kind is that known as Cognac, from the town in the centre of the district.

The *Garonne Valley* is another important vine-growing region. “ Bordeaux wines ” is the general name given to the wines made in the lower part of the area, but far up the courses of the river and its tributaries there are also extensive vineyards ; some of the more choice wines are exported, but by far the greatest amount is consumed in the country. In general, the Garonne valley is the most productive and the most populated part of Aquitaine. Wheat and fruit trees are grown throughout the area, and on the wide plains of Toulouse, below that city, maize and early vegetables are important productions ; tobacco is also grown in some parts of the Garonne valley.

Bordeaux is the port of the whole Basin, with about a quarter of a million inhabitants. Toulouse is not quite as large ; it is the trading centre of the upper part of the region, and is a focus of routes up the valleys of the Pyrenees and through the Gate of Carcassonne to the Mediterranean region of France.

Between the Garonne valley and the Central Plateau is a region which may be called the *North Garonne Lowland*. Its characteristic features are due to the subsoil being largely formed by Tertiary deposits known as “ mollasse ”—sandy and clayey accumulations worn down from the Pyrenees during and after the upraising of those mountains ; it was spread out over almost all the Basin, although now covered by later deposits on the Pyrenean side of the main valley. The region has a rather monotonous appearance, for on the mollasse have developed gently undulating plains, remarkably uniform except for the river valleys that have been cut into them. Wheat and fruit, especially plums, and fodder for cattle, characterize the agriculture.

Between the great curve of the Garonne valley and the Landes is an almost semicircular region rising gradually to the Pyrenees ; the name of the central district, *Armagnac*, may be adopted as a convenient label for the whole region. Here an immense alluvial fan has been formed of material brought down from the mountains : first the mollasse, then later Tertiary gravels, sands and clays, and on top of all Quaternary sediments.

Into this broad “ cone ” the rivers have cut valleys spreading out fan-like and draining either to the Garonne or to the angle

of the Bay of Biscay. In their upper parts these valleys are deeply cut into the plateau of the higher country where heathlands pasture sheep during their annual passage between wintering on the lowlands and spending the summer in the mountains. In the lower parts the valleys are wider and the climate is warmer and drier; here maize is widely grown, fruit trees and the vine become increasingly important as the region becomes lower, and Armagnac brandy is one of the well-known exports of the district.

Thus the Basin of Aquitaine, taken as a whole, is a sub-region of predominantly agricultural character and of a markedly southerly type; with a lack of mineral wealth and almost shut in by mountains and a difficult coast, it has had very little industrial or commercial development, and in consequence its population is not great and is mainly scattered in isolated farms or in villages and small towns.

Between the Pyrenees and the Central Plateau is the broad Gate of Carcassonne, whose fortified walls and castle still bear witness to its strategic importance in past centuries.

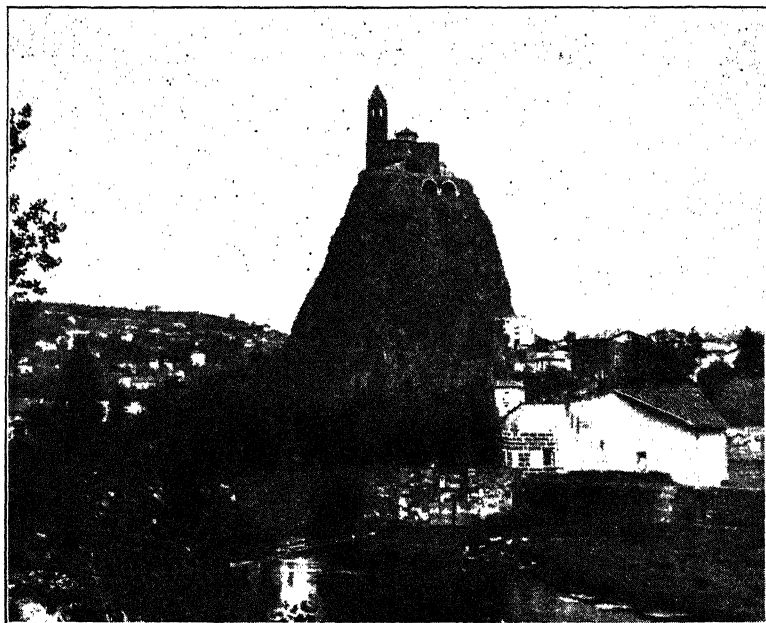
The adjoining region of the Pyrenees has a greater extension in Spain than in France, and will be dealt with in the chapter on the Iberian Peninsula.

The Central Plateau.—Although this region, frequently called the Massif Central by French geographers, appears on a relief map as an upland with few breaks in its continuity, it includes areas of extraordinarily contrasting character. Even where the surface shows little change in altitude, the appearance of the country and the mode of life of the people may change suddenly with the occurrence of a different bed-rock; hence, the geological structure is the key to the geography.

In this Hercynian Upland, the structure is complicated, for the "Armorican" foldings, with a north-west to south-east direction, approach the "Variscan" foldings, which run from south-west to north-east.

Moreover, in the upraised massif of the Central Plateau, marginal areas of Secondary sedimentary strata were incorporated. These areas can be seen by comparing the limits of the region as shown in Fig. 35 with the occurrence of the various strata as shown in Fig. 36; of special interest are the masses of Jurassic limestone in the regions of the south and south-west marked "Gr." and "Qu." on the regional map.

Another most significant feature of the Central Plateau is the existence of many great faults. Of these, one series forms the steep eastern margin of the region where it overlooks the Rhône-Saône trough.¹ Consequently, while in general the Central Plateau rises gradually from the west, its eastern boundary is almost mountain-like, and its high south-eastern edge, reaching about 4,000 or 5,000 feet, is known as the Cevennes.



[French Railways—National Tourist Office.]

FIG. 40.—VIEW AT LE PUY.

Note.—"Puy" is a common name for a summit in the Central Plateau, and it has been adopted as the name of the town "Le Puy" in the volcanic region west of the Upper Loire. North of the town rises the volcanic rock named "Rocher d'Aiguille," shown in the view; it is nearly 300 feet high, and on the top is a chapel built in the tenth century.

Another series of faults has produced two marked valleys in which flow the upper Loire and its tributary the Allier. That of the Allier is called the Limagne; it is a rift valley between faults running in a general north-to-south direction, and in it have been preserved Tertiary deposits and material worn down from the surrounding upland. The corresponding valley of the Loire takes the form of two down-faulted basins, also filled in

¹ In the geological map in Fig. 36 all these faults could not be shown without obscuring other features.

by Tertiary deposits ; the southern is known as the Forez Basin. The narrow upland left between these valleys of the Allier and the Loire is called the Forez Mountains.

Still another important element in the structure of the Central Plateau is associated with these dislocations, for through such cracks volcanic material was forced out and accumulated on the other rocks. In this region such recent volcanic rocks are found in great amount near the head-stream of the Loire, and on the western edge of the Allier Valley, where they form a distinct geographical region bearing the name of the Auvergne Mountains.

We may therefore distinguish five types of country which together constitute the greater part of the Central Plateau.

(1) The western crystalline and granitic plateau, frequently called the Limousin, which rises gradually from the lowlands ; (2) the upraised limestone plateaus of the south, known as the Causses ; (3) the volcanic region of the Auvergne ; (4) the faulted valleys of the Allier and Loire ; (5) the high eastern margin of complicated structure, including the Cevennes in the southern part and certain coalfields in the northern part. To these may be added two projecting spurs, the broad Morvan in the north and the Black Mountain in the south. These regional units differ from one another considerably in structure, altitude and position, and consequently in climate and utilization.

Limousin.—Where this plateau rises from the North French and Aquitaine Lowlands it is about 1,000 feet above sea-level, and it slopes gradually upwards towards a higher eastern part, frequently known as the Plateau de Millevaches, which gains an elevation of nearly 3,000 feet.

The lower western area has an equable, and on the whole warm, climate with a moderate rainfall, and its crystalline rocks have weathered to soils which have been improved by long manuring and by bringing chalk up from the neighbouring lowlands. There are arable lands, on which wheat and buckwheat are grown, but most characteristic are meadows, generally irrigated and cut for hay twice in the year, and plantations of edible chestnut trees. The farming is concerned mainly with cattle-rearing, and the chestnut trees yield both timber and also the nuts which form an important part of the people's food.

On the higher eastern part of the plateau the climate is colder and more cloudy ; there are heavy rains and in the winter

frequent snowfalls. On the rounded heights are granitic tors, also hollows filled with waterlogged sands; heaths abound, and there are woods of oak and beech. There is little cultivation, though some rye is grown, and cattle are bred to be sent to lower areas for fattening and sale.

The settlements in the Limousin are generally small; Limoges, on a tributary of the Loire, is the natural centre and market town of the lower plateau, and at this town are pottery and porcelain works having the advantage of kaolin from granite quarried in the neighbourhood.

The Auvergne.—This region, named after an old French province, consists of four main tracts, all volcanic, but of different origin, appearance and use.

In the north, overlooking the Limagne, is a relatively narrow belt marked P. on the regional map. This is formed of a considerable number of relatively recent cones, known as "Puy"; the best known is the Puy de Dôme. Though the volcanoes are extinct, their forms are still fairly well preserved, and on some of the lava fertile soils have developed. At their general elevation of nearly 3,000 to 5,000 feet, however, these lands have a comparatively severe climate and the heavy precipitation commonly takes the form of snow. Hence only such hardy crops as potatoes and rye can be produced, and, as on the neighbouring plateau, pastoral work is the main resource of the scanty population.

Farther south the belt widens to the mass of Mont Dore (D.), formed by the eruption of material from many neighbouring vents; here the volcanic accumulation reaches its greatest elevation, over 6,000 feet. Farther south again is the widest area, the Cantal (C.), once a volcano of still greater elevation than the Mont Dore mass, but of older date and now worn down to a rather less height. On these mountains the snow may lie for half the year, but their sides are deeply eroded, and in the lower parts of the valleys there are good soils and abundant water, and here fields, fruit trees and villages are found.

The "tail" of the Auvergne is the Aubrac (A.), an enormous stretch of bleak lava flows, of little value except as a summer pasture for cattle from farther south.

The Allier and Loire Valleys.—The two great head-streams of the Loire system derive their waters from a region where the melting of the winter snows frequently coincides with heavy

rains ; hence they are both subject to enormous floods in spring, in striking contrast with very low water in the usually dry summer. Moreover, at all seasons they are liable to great rises, for upon the surrounding highlands rain-water is not absorbed by the impermeable rocks, but rushes rapidly down the steep slopes into the two great valleys.

In Tertiary times these depressions were occupied by lakes, now drained, and upon the deposits of that period much alluvium has since been spread. The low altitude of the resulting plains, only about 1,000 feet above sea-level, gives them a relatively warm climate which at midsummer may indeed be hot, and the bordering uplands give them shelter. Consequently, where the soils are favourable, they are extremely productive and have attracted relatively dense populations into the heart of the Central Plateau. The Limagne is exceptionally fertile, for the proximity of the volcanic region long ago caused ash to descend upon it, and since then debris of mixed composition has provided material for the development of rich soils. Upon these soils wheat, various fodder crops and sugar-beet are grown, and the numerous villages are almost hidden by great orchards of pear trees, walnut trees and even apricot and peach trees, while vines are grown on the lower slopes of the valley sides.

Towns have grown up, the largest being Clermont-Ferrand on the edge of the valley almost underneath the Puy de Dôme ; here have developed manufactures, aided to some extent by a small local coal-supply, but depending almost entirely upon imported material. The central position in France of Clermont-Ferrand would seem largely offset by its situation within highland barriers, but it has risen to considerable importance in connexion with the motor-car industry and there are great rubber factories and also engineering works of various kinds.

The valley of the Loire is less productive, for the crystalline rocks above it have furnished sandy material which renders the Forez and other basins less productive than the Limagne ; wheat and potatoes are the chief crops. There is a cotton-spinning industry in the Roanne basin below the Forez, but no industrial development comparable with that of the Allier valley.

6 *The Causses*.—The name is derived from an old south French word for limestone, and the permeability of the rocks is the

fundamental factor in the characteristics of the regions. There are two main areas, the Grandes Causses (Gr. on the regional map), situated chiefly in the upper basin of the Tarn, and the Causses of Quercy (Qu.), cut by the middle courses of the Lot and Dordogne.

The Grandes Causses are limestone plateaus at elevations of between 2,500 and 3,500 feet above sea-level ; they are separated

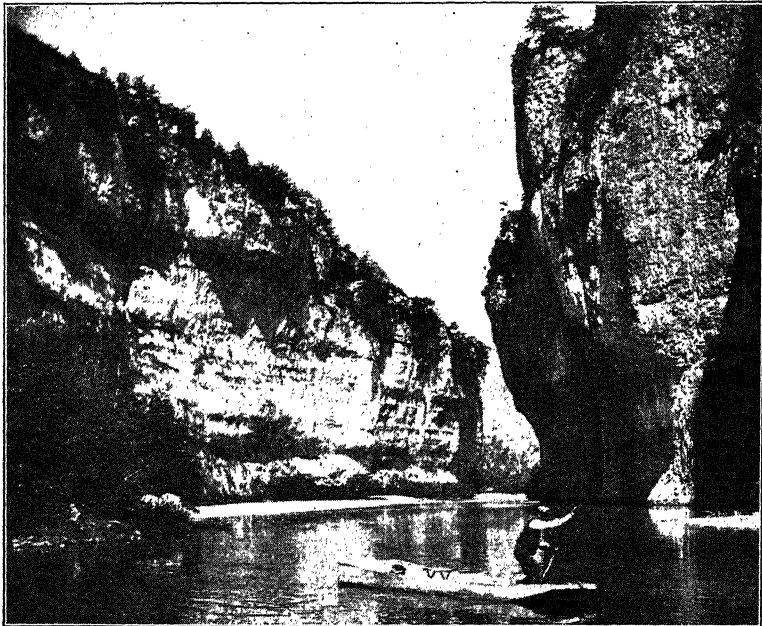


FIG. 41.—VIEW ON THE RIVER TARN.

[E.N.A.]

Note.—This shows part of the gorge cut into the limestone of the Grandes Causses. At one place the river-level is more than 1,500 feet below that of the neighbouring plateau. The limestone walls sometimes overhang the stream, where they represent the subterranean tunnels and caverns of an earlier stage of development.

from each other by the deep valleys of the Tarn, its tributaries, and other rivers draining either to the Atlantic or to the Mediterranean. Although the rainfall on these heights is great, the surface is usually dry and rocky ; there is little soil except in the hollows or the valleys, and generally vegetation is very sparse and sometimes practically non-existent. The water sinks into the limestone, and collects in cracks, which are widened by solution and corrosion till underground channels

are developed, widening in parts to caverns. In course of time the tunnels become very deep and their roofs may give way; the rivers are then exposed at the bottom of narrow cañons in some cases hundreds of feet in depth.

These valleys effectively separate the Causses from each other, and greatly impede communication, which, moreover, is often impossible in the valleys themselves. Surface streams upon the plateau are rare and sometimes suddenly disappear in swallow-holes, perhaps emerging in a cañon-like valley far away. Landscapes like that of the Causses are said to be of the "Karst" type, the name being derived from the similar Karst upland near the head of the Adriatic Sea.

With the lack of vegetation, the only considerable resource is the grazing of sheep on the poor pastures, and from the ewes' milk "Roquefort" cheese is made. Conditions of life are hard, especially in times of drought, when water may have to be carried great distances from the larger streams. Necessarily, the population of the Grandes Causses is extremely scanty and settlements are limited mainly to parts of the valleys where soil has accumulated and water can be obtained.

The Causses of Quercy are essentially similar, but they are of much less elevation, being little more than 1,000 feet above sea-level. Hence the valleys are less deeply cut, and the climate is less extreme; consequently the pastures are better, life is not so difficult and the population is rather greater.

The Black Mountain and Morvan Spurs.—In the extreme south the Central Plateau almost meets the Pyrenees in the spur of the Black Mountain, a crystalline mass which derived its name from the dark forests still covering it in part.

In the extreme north is the Morvan, whose highest part is of more complicated structure, but of generally similar appearance; from this it bears the Celtic name Morvan, which meant Dark Mountain. Around this height upraised sedimentary rocks, largely of Lias clay and Jurassic limestone, form a transition both to the North French Lowland and also to the Plateau of Langres, which continues the high ground to the Côtes de Lorraine and the Central Uplands of Europe.

The Eastern Margins.—Here is an area of great complexity which in one part or another includes all the types of country found in the Central Plateau. In the south the Cevennes, deeply scored by rivers running rapidly to the lower Rhône

or the Mediterranean, descend from heights of over 5,000 feet and show a zonal arrangement of vegetation as they reach lower altitudes and have higher temperatures : pastures on the heights give place to beech forest, and this yields to great plantations of chestnut trees before the mountains pass into low foothills and plains of "Mediterranean" character. On the edge of the Cevennes, faulting has let down and preserved the small coal basin of Alès, or Alais, and farther to the north-east a projecting spur of volcanic basalt, the Coiron, brings the plateau close to the Alps.

More important coal basins are found on the Central Plateau between the Loire valley and the Rhône-Saône Corridor. The direction of the Variscan folding is shown on the geological map by belts of Palæozoic rock running from south-west to north-east, and in these are productive Coal Measures ; moreover, the rocks have been worn down into hollows which facilitate communications between the Loire and Rhône river basins. There are three such coalfields, and of these the central one has the advantage of neighbouring iron ore ; here are the great armament and other iron and steel works at le Creusot. The southern one is the basin of St. Etienne ; its valley of over 30 miles in length has been described as a "long and infernal street" in which metallurgical industries of all kinds, glass-making and the manufacture of silk and artificial silk goods are carried on. From this coalfield coal is sent to Lyons, where it is used in power-plants when the water-power upon which they normally depend fails during the dry seasons.

Reviewing the characteristics of the Central Plateau, it will now be realized that its geological history has welded into close proximity very different types of country ; consequently it is not a simple sub-region, like the North French Lowland, in which there is much uniformity, but a composite sub-region with little more than its elevated situation in the heart of France as a common characteristic.

The Rhône-Saône Trough.—This great hollow is the result of the Alpine disturbances which produced both the folded ranges of the Jura and the Alps on the eastern side and also the faultings which separate it from the Central Plateau and its continuation, the Plateau of Langres, on the western side. At the northern end of the Saône trough are strata of Secondary age, but the

greater part of the hollow is floored by marls and other Tertiary deposits, and glacial material was brought down in great amount where the Rhône enters from the Alpine highlands.

The soils in the hollow are therefore varied, but where they are fertile the region is very productive, for the climate is favourable to cultivation. Because of the almost enclosed situation of this relatively low region, the temperatures approach the "continental" type, as is shown by the figures given for Lyons on p. 26: the July mean of 70° F. and the annual maximum of 95° F. are markedly high as compared with the January mean of 36° F., and the annual minimum of 10° F.; no other part of north-western Europe shows such extremes. The rain is abundant, due to the proximity of the great highlands.

The northern and central part of the broad Saône valley is a fertile country, with great stretches of wheat and maize, sugar-beet, hops and fodder crops for dairy cattle. Especially productive is the zone at the foot of the western hills, part of which goes by the name of the Côte d'Or; all along these slopes are vineyards and orchards of cherry, peach and other fruit trees. The wines are known by the general name of "Burgundy," from the old province of which this zone formed part.

The area of the Dombes (marked "Dom." on the regional map) in the angle east of the Saône and north of the Rhône is very different, for here the morainic material is spread out in broad, terrace-like formation, and on these levels there are impermeable clays. Consequently there is naturally bad drainage, and this area is the least populated of the whole region.

To the south the trough may be called the "Rhône corridor." Here fertility is again considerable; much maize is grown and vineyards stretch along its borders, some mulberry trees are still grown for silk-worms and thus agriculture is related to the silk industry of a number of centres in addition to the great works in and near Lyons. Most of the silk has to be imported through Marseilles.

The textile industry of Lyons, however, is now less dependent upon silk, which is to a considerable extent replaced by rayon produced from wood-pulp from spruce and pine woods which can be grown on the Central Plateau and the Alps. Another advantage of the situation of Lyons and neighbouring places

in the region is that machines can be driven by electricity from the water-power of the Rhône itself and streams from the adjoining highlands.

A still further, and very important consideration is the position in relation to distant markets, for the Saône valley gives relatively easy routes in two directions: the first is north-westward to the Paris Basin and the Channel ports by way of Dijon and the railways over the Plateau of Langres, and the other is north-eastward to the Rhine Lands and the North Sea ports by way of Belfort in the Burgundian Gate between the Vosges and Jura Uplands.

With other routes, such as the St. Etienne valley westward and the Rhône valley eastward, Lyons has a most marked nodal position, and it is not surprising that it has developed into a very important commercial centre. Naturally, to the same city have been attracted a number of other industries, including the production of chemicals and machinery. With its population of about half a million, Lyons is the third city of France.

The River Rhône is difficult for navigation, for the masses of water from the heavy rains on the surrounding uplands and the melting snows of the Alps make it liable to floods, which occur at various times in different parts of its course, and its current is often too swift for boats to go upstream; the valley, not the river, is so important for commerce. Recent developments undertaken by the State are dealt with in Chapter XIX.

Mediterranean France.—The traveller proceeding southward through the Rhône corridor, after passing the narrow gap between the Coiron and the western-most Alpine chains (again see Fig. 35), observes a different landscape, for before reaching Avignon above the Rhône delta, he sees extensive olive-yards as well as vineyards and orchards of fruit trees, and as a striking contrast thorny shrubs with bare, stony soil visible between them. The south-eastern corner of France belongs to a different major natural region of Europe.

Yet as it is on the northern margin of the Mediterranean, its climatic conditions differ somewhat from those farther south (refer to the figures for Marseilles on p. 26). In particular, winter temperatures are lower than common for other places near the sea-level, and the annual minimum is exceptionally low. This is due to the cold "Mistral" which arises when depressions pass along the Mediterranean basin and draw in,

from the chilled Central Plateau, air which descends the Rhône valley in bitter blasts. As a consequence, the growing of oranges and lemons is restricted to such parts as the extreme east of the French coast away from the Rhône valley.

The varying conditions of climate, relief, soils and opportunities for trade lead to considerable differences in the areas which together constitute the Mediterranean sub-region of France.

Constituent Areas: (i) *Bas Languedoc*.—The western part of Mediterranean France is formed mainly of the lower part of the old province of Languedoc; it comprises three tracts: (a) Inland is a hilly area largely formed of limestones, on which there are plantations of vines, olive and mulberry trees, though large parts are poor garrigues used only for winter pasturing of sheep sent up to the Central Plateau in summer. (b) Nearer the sea are alluvial plains devoted, to an unusual extent, to vineyards yielding almost half the total amount of wine of France, though its value is not proportionally so great. Such a "one-crop" form of production has its dangers, and this region has suffered greatly from the phylloxera disease of the vines, and also from periods of low prices for wine. (c) The coast is being straightened by material washed from the Rhône delta by the counter-clockwise currents of the Mediterranean Sea; dunes enclose brackish lagoons, from the waters of which salt is obtained by evaporation. The old port of Aigues Mortes at the edge of the delta is now inland and Cette (Sète), farther west, has an artificial harbour.

(ii) *The Rhône Valley and Delta*.—The formation of deltas is facilitated by the almost tideless nature of the Mediterranean Sea, and the delta of the Rhône occupies a considerable area. Near Arles, the river divides into two branches; between these is the Camargue, the "wet delta," while to the east is the Crau, the "dry delta," formed largely of pebbly deposits brought down by the Durance. The Camargue is being redeemed by forming fields protected by firm banks and by drainage and irrigation; here much rice is cultivated in summer. Also there are winter pastures for Alpine sheep and in swamps reeds are grown for paper making.

The greatest significance of the lower Rhône valley is in affording an easy route connecting northern Europe with the Mediterranean Lands and, behind them, the Far East. This

route has been important for more than 2,000 years ; the towns of the Rhône valley, such as Avignon, Nîmes and Arles, still have in their buildings the evidence of Roman occupation : fortresses, arenas, temples and aqueducts, and the great commercial city Marseilles is of even earlier origin, for it began as the site of a Greek colony.

Marseilles is not actually in the Rhône valley, but is placed by a bay at the side of the delta which is safe from the silting action of the currents, and the harbour has the advantage of deep water. The bay is open, however, and artificial shelter has had to be provided, while to cope with the traffic a great canal has been tunnelled through the ridge north of the bay into a lagoon adjoining the delta. The Rhône itself is not here navigable, and only a small canal leads by the side of the river to Arles.

Traffic has therefore to go northward from Marseilles by rail, and the greatest amount of the imports is destined to serve the needs of the people and the industries of the Rhône valley itself ; most of the trade of Marseilles, indeed, is between south-eastern France and the territories of the French Union in North Africa and southern Asia. From north-western Europe, however, there is much passenger traffic, which takes advantage of the quick railway route to the Mediterranean as compared with the long sea journey *via* the Bay of Biscay and the Strait of Gibraltar.

Round the port of Marseilles industries have developed, particularly those requiring imported material, such as the making of soap, margarine and chemicals, and the refining of sugar ; the population of Marseilles is now about three-quarters of a million, and it is therefore the second city of France.

(iii) *Basse Provence*.—The old French province, Provence, extended from the Alps down to the rocky coast, and that part which is within Mediterranean France is largely upland. In this easterly part of Mediterranean France, the Alps to the north give more protection from cold winds, and the pleasant, indented coast has proved attractive to visitors seeking warmth and sunshine ; this is the beginning of the Riviera coast, which is further dealt with in the chapter on the Italian lands. The same favourable climatic situation which has led to the growth of large and fashionable resorts such as Nice and Cannes has also favoured a large-scale cultivation of flowers for export and for the making of scent.

In an almost land-locked bay has been established the great arsenal and naval port of Toulon, by which shipbuilding yards have been constructed; its situation on the direct routes between France and other parts of the French Union makes it, politically and strategically, important in Mediterranean France.

Note.—It should be borne in mind that regions which form part of eastern France are dealt with in the following two chapters.

QUESTIONS ON CHAPTERS VIII AND IX

1. Consider on broad lines the similarities and dissimilarities between the lowlands of South-eastern England and those of North-eastern France.

2. Discuss to what extent the geological structure, apart from other geographical factors, has determined the characteristics of the North French Lowland.

3. Give a reasoned account of the distribution of the main occupations of the people in North-eastern France (including the part in the North Sea Lowlands region).

4. Examine the situations of the larger towns of North-eastern France, and classify these situations in relation to the physical geography.

5. Examine (*a*) the common characteristics, and (*b*) the internal differences, of the Breton Peninsula.

6. "The Breton Peninsula of France resembles the Devonian Peninsula of England." How far is this true?

7. Contrast the lowlands of South-western France with those of North-eastern France, and account for the differences.

8. Write systematic notes on the wheat and wine production of France.

9. State, and briefly describe, the differences in the landscape to be observed on a journey from the Saône valley near Dijon to the Mediterranean Sea.

10. Examine the statement: "The Central Plateau has little more than its elevated position in the heart of France as a common characteristic."

11. Write an essay on the ports of France.

12. Test the truth of the dictum that river basins are not natural units, by reference to the rivers of France.

CHAPTER X

THE CENTRAL UPLANDS

THE complexity of this part of Temperate Europe is due to the "Alpine" disturbances which, north of the Alps themselves, produced (1) the long, upraised belt of the Alpine Foreland; (2) the folded ridges of the Jura; (3) the upthrust Hercynian massifs of the Harz Mountains (marked "H"), the Rhine Plateau

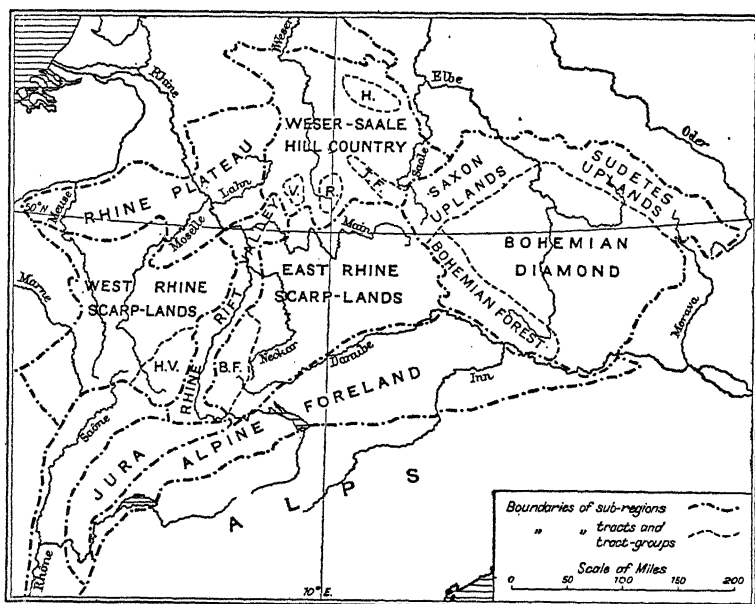


FIG. 42.—REGIONS OF THE CENTRAL UPLANDS OF EUROPE.

through which that river runs between Bingen and Bonn, the Thuringian Forest ("T.F."), the High Vosges, the Black Forest, and the Bohemian "Diamond" and its margins, the Bohemian Forest, the Saxon Uplands and the Sudetes Uplands; (4) the tilted areas of sedimentary strata between the Hercynian fragments, viz. the East Rhine Scarp-lands, the West Rhine Scarp-lands, and the Weser-Saale Hill-country; • (5) the sub-

sided Rift-valley of the Rhine ; (6) volcanic masses such as the Vogelsberg and the Rhön ("V" and "R").

These structural units, either singly or in a group, form the sub-regions which we will now consider in turn.

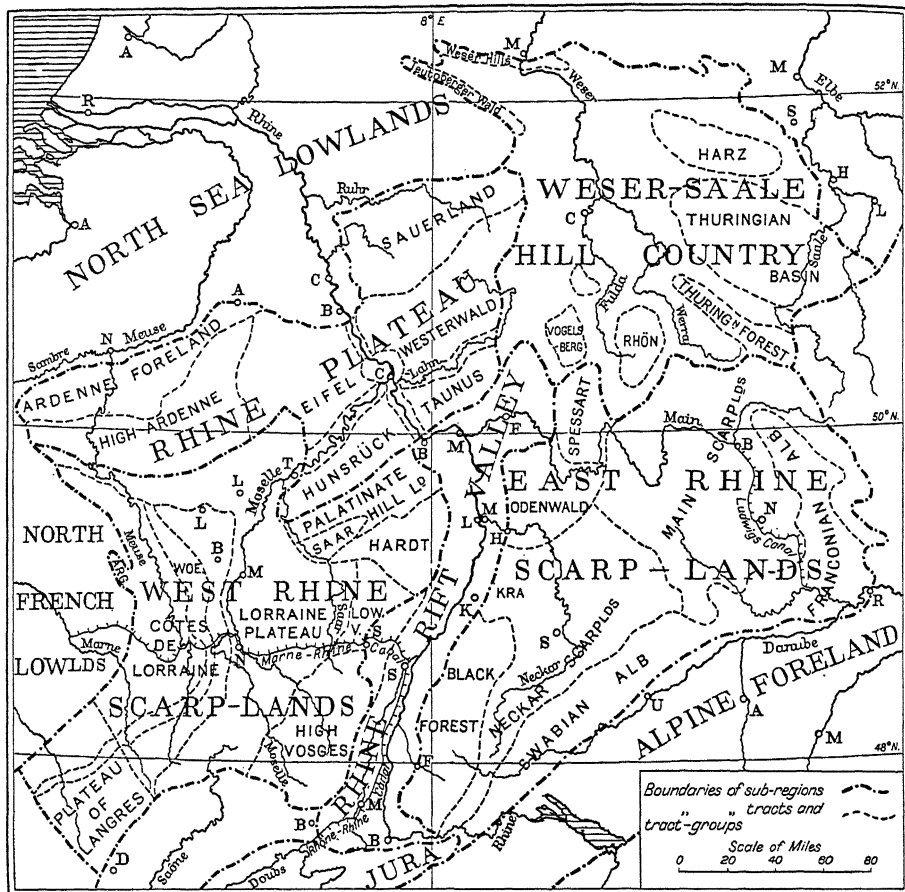


FIG. 43.—REGIONS OF THE RHINE UPLANDS.

Note.—Ludwig's canal is now replaced by the Rhine-Main-Danube canal.

The Rhine Plateau.—This massif is mainly composed of resistant slates, sandstones and quartzites, and in the north of less-resistant limestones, of Palæozoic Age (refer to Figs. 43 and 44). It has been more or less faulted on all sides, and upraised most markedly on the south-eastern side, where its

high borders, known as the Hunsrück on the west of the narrow Rhine valley and the Taunus on the east, rise to over 2,500 feet. From this margin, the block dips on the whole towards the north-west, so that its edge, the Ardenne Foreland, stands about 700 feet above the Sambre-Meuse valley and the Sauerland stands at about the same height above the lower Ruhr area. As the north-western side of the Rhine

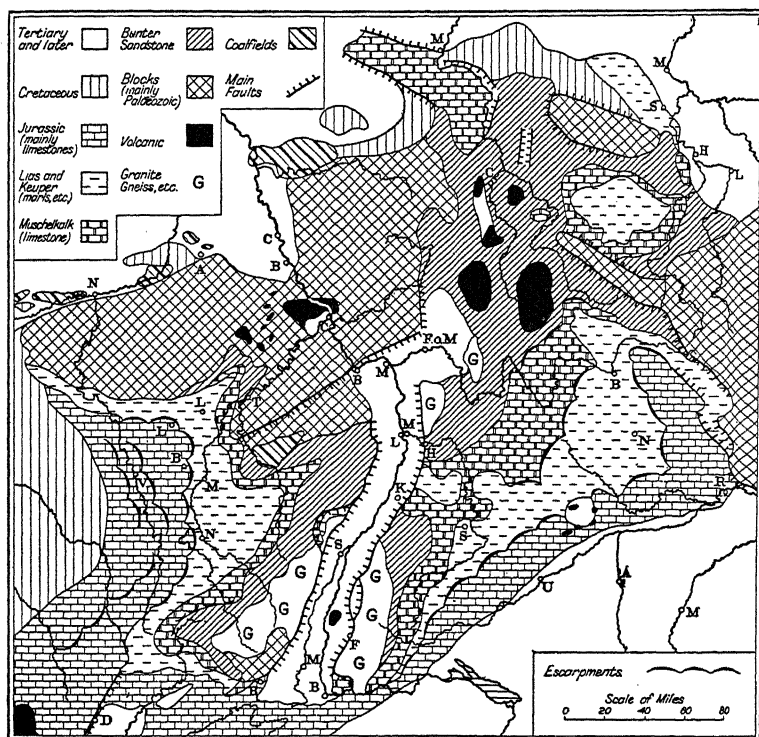


FIG. 44.—STRUCTURE OF THE RHINE UPLANDS.

Plateau is broken by the low subsidence-area of the Cologne embayment, so the south-western side is broken by a less-marked subsidence-area, the Luxembourg embayment, which forms part of the West Rhine Scarp-lands. The greater part of the plateau is German, though its north-western wing extends into Belgium, France and Luxembourg.

Before Central Europe had attained its present relief, the Rhine crossed the region towards the north-west, flowing in

gentle meanders, and its tributaries, the Moselle (named Mosel in Germany) on the west and the Lahn on the east, had similar courses. All these streams have continued to cut their valleys into the massif, and their meanders have become incised into the upland. Hence they have very winding courses, and the steep sides of the narrow valleys face in turn towards almost all directions as they overlook the meanders of the rivers.

North of the Moselle and Lahn valleys, the uplands are partly formed of volcanic rock in the Eifel and the Westerwald areas. In the Eifel, a mass of basalt rises to well over 2,000 feet, and there are small volcanic cones and lakes giving variety to scenery which attracts tourists.

Because of its elevation the Rhine Plateau has a markedly different climate from that of the adjoining North Sea Lowlands. The temperatures are lower, the precipitation is greater and the winds are frequently stronger; consequently the winters are severe, heavy snowstorms occur and a snow cover which is commonly some feet deep may last for weeks. The melted snows and rain cannot drain through the impermeable rock of the plateau, and the surface is often wet; many of the wide hollows are marshy or peat bogs. Large areas of the upland and the ridges bear deciduous forests or plantations of conifers, though lower parts of the plateau have been turned into cattle pastures, and some of the land has been ploughed for the hardier cereals, oats and rye, or dug for potatoes, while on the limestone areas of the northern margin even some wheat and beet are cultivated. On the whole, however, the region has not proved remunerative to farming.

In some parts of the north, industries were long ago based upon the occurrence of ores, mainly of iron, worked by fuel from the forests and water from the rapid streams near the edge of the upland. To some extent these industries have survived, importing coal from the adjoining coalfields of Germany and Belgium, but as a whole the plateau areas support few people.

In the deeply cut valleys of the Rhine, Mosel and Lahn, however, conditions are very different. The warmer and sheltered situation allows cultivated fields and rich meadows where the rivers have left fertile deposits beside their meanders, and there are orchards and vines on the slopes which face the sun. The Mosel valley is particularly renowned for the wine which is the main product of that region, and in this and in the

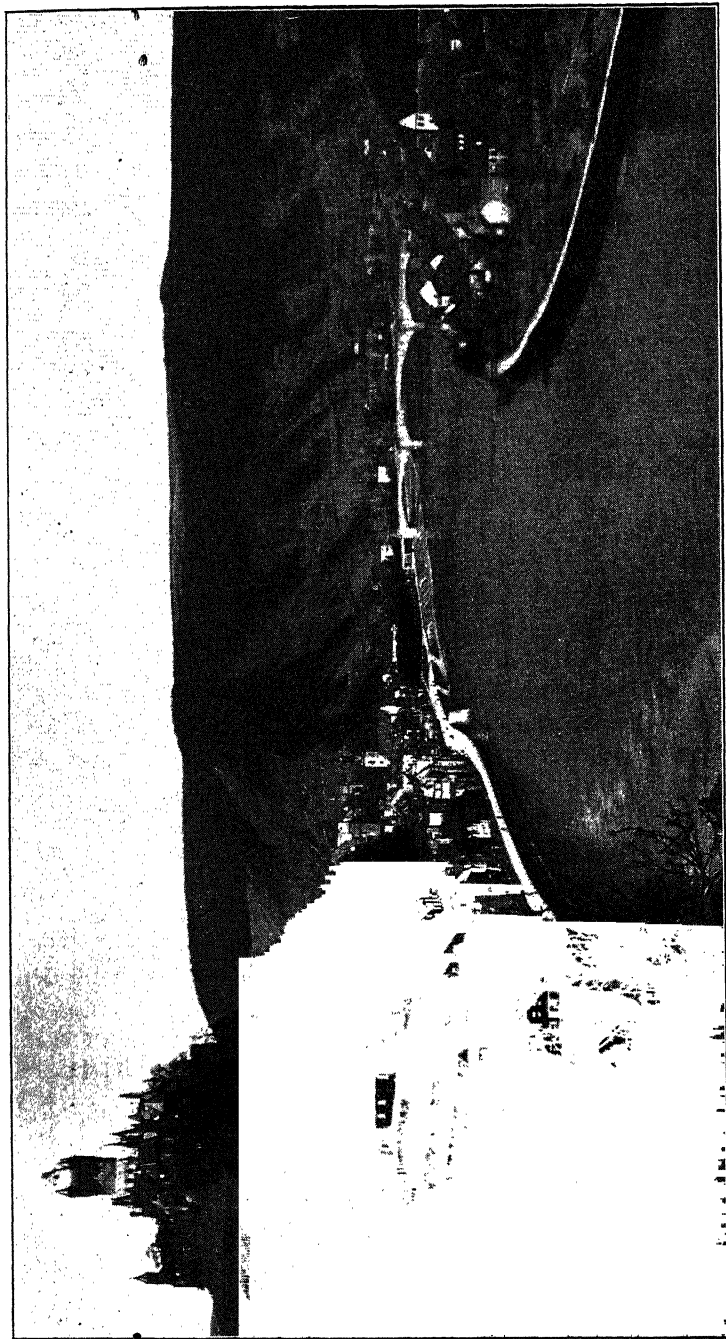


FIG. 45.—VIEW ON THE MOSEL.

Note.—The flat top of the Rhine plateau is clearly shown; on the outer side of the incised meander of the Mosel there is practically no lowland, and the road has had to be built up at the river's edge, but on the inner side a small flood-plain has been formed. The castle of Cochem crowns the height remaining between two side valleys; where the largest one (beyond the castle) enters the main valley the town of Cochem has grown, and the Mosel has been bridged. The view is taken approximately from the south, and the warm south-facing slopes appear light where they have been cleared for vineyards; the darker patches are the woods still remaining on the upper levels, and even on the lower north-facing slopes, as shown on the extreme right. Field cultivation appears only on the small flood-plain area.

[German State Railways.

other larger valleys are a number of small towns depending upon the local trade which uses both the rivers and the roads along their banks.

The Rhine valley is of the greatest importance as a route for commerce, for with this exception the plateau bars the way between north and south. River steamers, railways and motor-cars carry a great deal of traffic through the valley, but there is no large river port in the region; Coblenz, in a widening of the valley and at the confluence of the Moselle and Rhine, is an ancient town with historical buildings, but it has not grown into a great modern commercial city.

The Rhine Rift-valley.—An almost complete contrast to the Rhine Plateau is shown in this down-faulted trough, for it has a drier and sunnier climate, wide areas of fertile land and large cities on or near the river banks. Within the valley itself, differences are mainly due to the various strata which have been relatively recently deposited in the great hollow or on its margins, and we may note four types of constituent areas, working back in our description from those most recently formed to those of earlier origin.

The Flood-plain of the Rhine.—This is shown in the map in Fig. 46 and the section in Fig. 47. It is situated immediately by the river, and would still be subject to inundation were it not for the embanking which, together with the straightening of the stream, has been carried out during the past century.

(i) Above Basel (Bâle) the river is too rapid for navigation (though improvements are projected), and has cut a relatively deep and narrow valley. Basel is at the head of navigation on the Rhine and has some trade on that account, but its greatest importance is due to its position at a gap between the upland areas where routes from the north lead towards passes across the Alps. Because of its nodal position it has become one of the main entries to Switzerland, and with a population of about 200,000 people it is the second city of that country.

(ii) Below Basel the river enters the broad valley, and as far as the neighbourhood of Karlsruhe the stream deposits more material than it removes. Enormous amounts of gravels and sands are brought down from the Alps, particularly during great summer floods, and near the stream the water-level is always near the surface, which is therefore frequently wet; even after improvements there remain extensive "moors," and alder-

woods, and the chief use of the flood-plain is for pasture. Strasbourg, a few miles up the Ill tributary, is a centre of inland waterways, for most of the lower Rhine traffic stops here, and between the Ill and the Rhine the Rhône-Rhine Canal goes up the valley to cross the watershed west of Basel to southern France; another waterway, the Marne-Rhine Canal, leaves the Ill at Strasbourg to cross the West Rhine Scarp-lands into northern France.

(iii) North of Karlsruhe the Rhine meanders through a flood-plain which is drier and more capable of utilization than farther up-stream. Moreover, the more regular régime and the greater depth of the river allow navigation of larger boats, traffic is greater and there are busier river-ports. The greatest of these is Mannheim, at the head of navigation for large barges, and here and at Ludwigshaven, its twin-port across the river, are considerable industries; together these cities have a population of nearly 400,000 people.

Where the Rhine turns under the edge of the Taunus, it receives its tributary the Main, and at the junction is Mainz, another river-port and industrial centre.

The Rhine Terrace-lands.—On either side of the flood-plain rise the terrace-lands, formed of older deposits of sands and gravels now situated above 20 feet above the river. They are dry and generally infertile, and in parts there are still great pine-woods. At some points, however, cities have grown up: Mulhouse, in the extreme south where the Ill and the Rhône-Rhine Canal enter this region, has important textile industries, and so has Colmar, close to the Ill farther down its course; between the two towns mines are driven through the surface to reach potash and other salts in the deeper strata of the valley, and the chemicals obtained from these salts aid chemical and dye works connected with the textile industries of the towns.

On the right-bank terrace is Karlsruhe, where a mediæval castle, guarding routes along and across the valley, aided the growth of a town which has now become a modern commercial and industrial city.

The Foothills and Marginal Plateaus.—Behind these past and present river deposits rise areas formed of sedimentary rock of Tertiary or even older date. The faulting which produced the rift was complicated, and there are large areas which have been let down half-way, as it were, and lie between the lowest parts

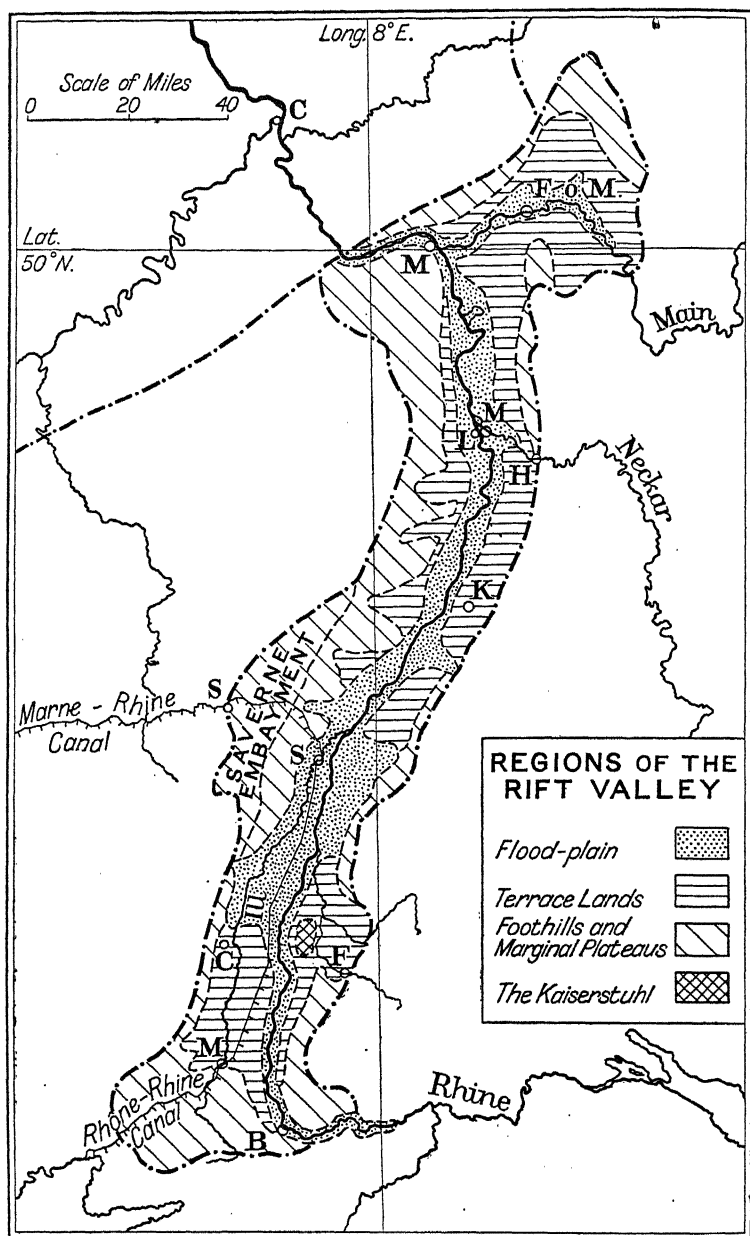


FIG. 46.—REGIONS OF THE RHINE RIFT-VALLEY.

of the valley and the scarp-lands beyond it. Such an area is the Saverne embayment, west of Strasbourg; it is named after a small town in a side valley through which passes the Marne-Rhine Canal, as well as railway and road.

The Rift-valley in general has a relatively low rainfall and much sunshine, and because of its southerly latitude as well as its low and sheltered position it is the warmest part of central Europe; its summers may indeed be called hot. Moreover, almost all the foothills and marginal plateau areas were covered with a mantle of loess in the post-glacial period.

Consequently these marginal areas of the Rift-valley are exceptionally fertile. They yield wheat and maize; fruits, including peaches, apricots and even almonds; industrial crops of chicory, beet and tobacco; in addition, there are vineyards

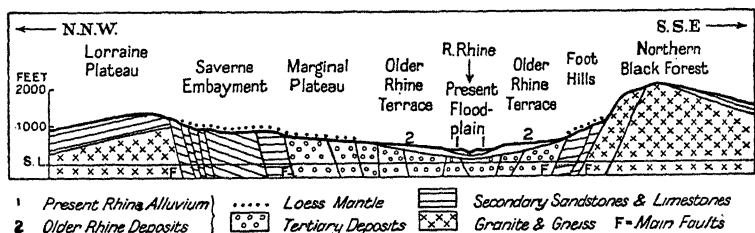


FIG. 47.—SECTION THROUGH THE RHINE RIFT-VALLEY.

which make this the most important wine-producing region of central Europe.

Hence there is a considerable population even in the rural districts, and there are also a number of important cities, particularly where routes enter the valley, e.g. Freiburg and Heidelberg; Frankfurt-on-Main is at an important nodal position at the north-eastern corner of the Rift-valley where traffic from north to south crosses the Main; it is the chief commercial, financial and industrial centre in the south-west part of Germany.

The Kaiserstuhl.—Overlooking the Rhine near Freiburg stands a small, fairly flat-topped plateau rising about 1,000 feet; it is the remains of a great volcanic mass of Tertiary date, called the Kaiserstuhl—the Emperor's Chair. The lava has weathered to fertile soil, and even the steep slopes are terraced for vines.

Thus the Rhine Rift-valley, as shown in Fig. 21, is a lowland sub-region within the Central Uplands.

East Rhine Scarp-lands.—It appears that as a result of the Alpine thrust towards the north-west the whole area now comprising the Rhine Rift-valley and its bordering East and West Scarp-lands was bent up into a dome-like form, the highest part being over the present site of the Rift, and the strata dipping down on either side.

The central strip of the dome foundered and formed the great valley, but the bordering uplands remained ; their tilted strata on either side are therefore of similar structure and dip away from the Rift in each case. The section in Fig. 48 shows this arrangement, and the broken lines suggest how the layers once continued to join over the central area. As the dome-like uplift was highest over the southern part of the Rift-valley, the bordering scarp-lands are here highest, and here all the sedimentary strata have been worn away, leaving granites and gneiss to form the uplands of the Black Forest and the Vosges Mountains. Farther to the east and west respectively the sandstones and limestones remain, but have been worn into scarp-lands whose steeper sides look inward while the more gentle slopes dip outwards.

The two wings of this formation differ, however, in several respects, and we will first describe the East Rhine Scarp-lands.

The Black Forest.—In addition to the main eastward tilt of the strata of the scarp-lands, there has been a downward warping north of the Black Forest, and consequently the granites and gneiss of the highest part of that area dip down beneath a cover of Bunter sandstone which forms the surface of the lower and northern part of the Black Forest.

The granitic masses in the south have weathered into rounded heights, such as the Feldberg, which reaches nearly five thousand feet. The rainfall is, of course, considerable, and as the tree-line is at about 4,000 feet, the highest parts tend to be moors, heaths or rough grazing-grounds ; cattle are sent up to them when the snow melts in May and remain till about October, and the chief product from these summer pastures is cheese.

Lower than these highest parts in the south-west, and covering much of the sandstone area of the rest of the region, are great forests of spruce and fir, to the distant appearance of which the name Black Forest is due. Although in the valleys there

is some cultivation of oats, rye and potatoes, and there has been some plantation of cherry and edible chestnut trees, the main resource of the Black Forest is the timber, either exported as such or used as the material for the carved products of domestic industry or as fuel for glass-making. In summer many tourists visit the region, but on the whole it is very scantily populated.

Odenwald and Spessart.—North of the Black Forest, the Bunter sandstone dips down below the limestones and marls which form the surface of the scarp-lands east of Karlsruhe, but it rises again still farther north and north-east; here, because of its relatively greater resistance and granitic outcrops, it forms the uplands of the Odenwald and Spessart. These are rather like the Black Forest on a small scale, but they do not rise above the tree-line, the forest-cover consists mainly of oak and beech and there are wider areas of cultivation, although most of the

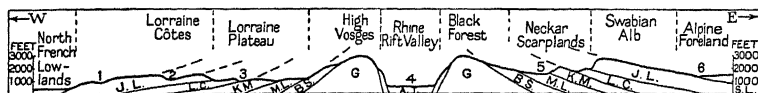


FIG. 48.—SECTION THROUGH RHINE SCARP-LANDS.

Note.—The section is drawn from west to east, south of the latitude of Strasbourg, to Ulm on the Danube. The figures 1, 2, 3, 4, 5 and 6, indicate the valleys of the Marne, Meuse, Mosel, Rhine, Neckar and Danube. The strata are indicated by the following initials: A.T. = Alluvium and Tertiary deposits in the Rhine valley; J.L. = Jurassic Limestone with interbedded clays; L.C. = Lias Clays with some limestones, etc.; K.M. = Keuper Marls and Sands; M.L. = Muschelkalk Limestone; B.S. = Bunter Sandstones; G. = Granite, Gneiss, etc., of the Vosges and Black Forest.

country is mainly dependent upon forestry. They are essentially one region, though separated by the valley of the Main, which cuts right through the upland, while the Neckar similarly cuts through the southern part of the Odenwald.

The Neckar-Main Scarp-lands.—The upper courses of these rivers drain country which they have etched out of the layers of Muschelkalk limestone, Keuper sandstones and marls, and Lias clays, marls and weak limestones. In general, the marls and limestones have been worn down to plateaus at an elevation of about 1,000 feet, above which the more resistant sandstones stand with scarps rising another 500 or 700 feet. The climate varies according to altitude, and the lower lands grow wheat and fruit, even the vine in the valleys; in the inner part of the Main basin the best hops in the world are claimed to grow. The higher sandstone scarp-lands, however, are less fertile; they bear extensive woodlands with both deciduous and coniferous trees.

The Swabian and Franconian Alb.—The easternmost part of the scarp-lands is formed by the massive strata of resistant Jurassic limestone which overlook the Neckar-Main area from heights reaching over 3,000 feet above sea-level in the western or Swabian part and rather less in the eastern or Franconian part. The word "Alb" has the same meaning as "Alp," i.e. summer pasture, and the higher parts of this region, bare and bleak, still deserve the name, though where the region is lower towards the Danube farming is more remunerative. Yet as a whole this region is relatively unproductive, and the population is scanty.

In the north, the Franconian Alb is faulted down eastward, and between it and the Bohemian Massif is an extension of the Main region.

Routes and Cities.—The lower parts of the Neckar-Main Scarp-lands have a considerable population dependent upon agriculture, and there are several large cities on routes which lead through the region. One such line of communication cuts across the south-west portion from Karlsruhe in the Rift-valley, through the Kraichgau ("Kra." in Fig. 43), the hollow between the Black Forest and Odenwald, crosses the Neckar by Stuttgart and continues towards Ulm, the head of navigation on the Danube; Stuttgart is now a city of over 400,000 inhabitants.

The other important route is in the east of the region: it comes from northern Germany by the head-streams of the Weser to the upper course of the Main, which it crosses at Bamberg. Then it proceeds southwards underneath the heights of the Franconian Alb as far as Nürnberg (Nuremberg), and thence three routes diverge. One goes south-east by a small valley through the escarpment to the Danube above Regensburg, and by this route the small "Ludwig's Canal" joined the Main system to the Danubian system of waterways; its course is now followed by the new and important Rhine-Main-Danube Canal, which allows through traffic by water across the whole of Germany from the north-west to the south-east.

Two other routes lead more directly southward from Nuremberg through valleys of the Alb, to cross the Danube to Munich and Augsburg respectively; thence they enter the Alpine region, make use of the Brenner Pass, and so reach Venice and the Mediterranean. From the time when traffic used these routes

to bring spices, silks and precious stones and metals from the East, the cities on these roads have been famous ; in Nuremberg is found some of the finest architecture of the Middle Ages, together with modern business houses and factories, for it is now an industrial centre with 400,000 people.

The West Rhine Scarp-lands.—This sub-region differs from its eastern counterpart in two important respects. In the first place, it is farther from the Alps, and consequently the Jurassic limestone strata have not been uplifted to any great height ; indeed, they dip westward into the great structural basin centred upon Paris.

In the second place, the build is complicated where the region impinges upon the southern tip of the Rhine Plateau ; here, overlooked by the Hunsrück, is an area which makes a transition between the plateau and the scarp-lands. Like the plateau, it is formed by a mass of ancient and relatively resistant rock, but it has not been uplifted to the same extent, and its dissection has resulted in a hilly rather than a high plateau type of country ; it may be called the *Palatinate Hill-land and the Saar Basin*. This region is economically important because in its south-western part, the Saar Basin, are preserved Coal Measures which have given rise to the Saar coalfield. With the aid of this coal, iron ores from the Lorraine deposits farther west are worked and an iron and steel industry has developed.

The remaining parts of the West Rhine Scarp-lands show a broad resemblance to those east of the Rift-valley.

The Vosges Mountains are similar to the Black Forest, particularly in the higher portions, but the east-facing slopes, in Alsace, are relatively dry and sunny and have more cultivation ; also in the lower parts of the valleys, both on this eastern Alsatian side and also on the western, or Lorraine side, are villages and small towns where a small, old-established woollen and linen industry has persisted and led to a more important cotton industry, aided by the water-power of the rapid streams.

North of the mountainous *High Vosges* is the hollow of the *Low Vosges*, still partly forested, while farther north and north-east rises the *Hardt Upland* corresponding to the Odenwald, though without granitic outcrops.

The *Lorraine Plateau* is situated west of the Vosges, the Hardt and the Saar Basin. Here are the same rocks as in the Neckar-Main Scarp-lands, with Muschelkalk giving good soils for

cereal growing, Keuper marls having rich pastures and Lias clays more difficult to work.

These strata in France, however, are at a generally lower elevation than those in Germany, and have not been worn into such marked relief, though the Lias clays have been cut into a rather deep valley belt by the Moselle and its tributaries, the rivers which drain nearly all the Lorraine Plateau.

This valley belt, cut into the Lias clay by the Moselle, lies under the scarp of the Jurassic limestone region which is situated immediately to the west (see Fig. 44), and at the junction of the Lias and Jurassic strata are rocks in which occur iron ore known as minette. The minette ore is mined around the town of Nancy, in and near the Moselle valley, and iron and steel works have grown up in this neighbourhood.

Farther north, on the edge of the Moselle valley, is the fortress of Metz, important because Lorraine has for long been debatable ground between France and Germany.

The Jurassic limestone region which is situated to the west is perhaps most conveniently termed the *Côtes de Lorraine*, for in the east where it is highest the edges of its scarp overlooking the Moselle are known as the *Côtes de Moselle*, and farther west it is again deeply cut by the Meuse, and the resultant hill-slopes are called the *Côtes de Meuse*; overlooking this Meuse valley is the fortress of Verdun. In the south part of the limestone belt the drainage is not to the Rhine, but to the Seine, whose tributaries, especially the Marne, have also cut deep valleys.

The rainfall is fairly heavy on the higher parts of the limestone plateau, which, like the Ardenne, is on the side of the Central Uplands facing the Atlantic winds. The highest areas are much wooded, while the rest of the plateau is rather poor agricultural country.

The whole region is not an unbroken plateau, for between the upper and lower limestones are clays which outcrop in a belt running longitudinally; this clay-belt has been worn to a relative hollow, and part of it, known as the Woëvre (Woe. in Fig. 43), is naturally marshy and even yet has small lakes.

The minette iron ore which is situated at the base of the Jurassic strata is reached in two districts by mining through the rocks which form the edge of the escarpment; one is in the "Briey basin," north-west of Metz, whence the ore is sent

in part to Germany for working, and the other is in the "Longwy basin" at the northern part of the scarp. Here the Jurassic escarpment faces north and almost coincides with the boundary between France on the one side and Luxemburg and Belgium on the other. The iron ore is utilized in all three countries (see Fig. 76 in Chapter XIX); it is of most value to France and Luxemburg and forms an important part of the basis of the economic life of the latter small State.

The western margin of the limestone belt rises fairly definitely from the clays of the North French Lowland which succeeds it to the west, but in one part there is, as it were, a bastion of uplands projecting from the main area. This is the Argonne Forest region, where an admixture of sand with the clay has enabled the stratum to resist erosion, and wooded heights of about 1,000 feet mark the sharpest contrast between the Central Uplands and the North French Lowland.

South of the Marne the limestone belt rises to an area whose escarpment forms the high Plateau of Langres; this links the Central Uplands of Europe to the Central Plateau of France.

The Weser-Saale Hill Country.—Most of this area is drained by the upper Weser and its tributaries, and much of the rest by the Saale tributary of the Elbe; for this reason, and because it is very uneven in its relief, a convenient name is the Weser-Saale Hill Country.

The Harz.—One of the most striking features as seen on a relief map is the upstanding mass of the Harz Mountains. This is a typical horst, markedly fault-edged on the north-west, south-west and north-east sides, though its surface descends more gradually towards the south-east. The "Upper Harz" in the north-west reaches over 3,500 feet and is almost completely covered with dark masses of spruce forest, but the "Lower Harz" in the south-east has deciduous woods and also many clearings for agriculture and small settlements. A little mining of copper is almost the only survival of past varied and important mineral industries.

In the *Harz Foreland*, to the north-east and south-east of the massif, potash salts are obtained, which aid chemical works such as those at Stassfurt situated in the neighbouring lowlands near the Elbe; also, just within the upland region south of Brunswick, there are deposits of high-grade iron ore which have recently been utilized.

The Thuringian Forest.—Very similar to the Harz is the Thuringian Forest; here the main faults which bound it run in a north-west to south-east direction and give it a long and relatively narrow shape with a fairly flat top, reaching over 3,000 feet.

The Weser Hills and Teutoburger Wald.—Almost the same general direction is shown by the two lines of hill country which project north-westward far into the North Sea Lowlands. They are formed of sedimentary rocks of Secondary Age, folded and faulted, but only to a moderate elevation, and the "Wald" or "Forest" has mostly given place to farming.

The Rhön and Vogelsberg.—In the south of the Weser Hill Country rise two great volcanic masses, the Rhön and the Vogelsberg; since they reach elevations of about 3,000 feet, their higher parts are moorland or forest. Other wooded volcanic heights lie on either side of the Fulda tributary of the Weser.

The Fulda Valley offers a useful means of communication from the Rhine Rift-valley to the North German Plain, and this relatively low and fertile country is rather like that of the valleys of the Main and Neckar.

The Thuringian Basin.—Farther east, between the Harz and the Thuringian Forest, is an important area, drained by the Saale. It is formed of the same strata as the Rhine Scarp-lands, bent downward into a syncline forming an oval-shaped basin between the surrounding heights. The outcropping strata have been etched out by the tributaries of the Saale to form a series of low scarps, and the basin as a whole resembles the Neckar-Main Scarp-lands on a smaller scale; it is a well-developed region of productive agriculture.

The Bohemian Massif.—The area drained mainly by the upper Elbe river system may be thought of as largely formed of ancient rock, including granite, gneiss and schists, faulted in two main directions: south-east to north-west, and south-west to north-east (see Fig. 50). Along the faults, blocks have been raised or lowered to produce four main regions:

(i) A central area, sometimes known as the "Bohemian Diamond," of moderate elevation on its south-east side, but lowered towards the north; here it is bounded by the uplifted edges of (ii) the Sudetes Uplands on the north-east, and (iii) the Saxon Uplands on the north-west, while another faulted and

raised area, (iv) the Bohemian and Bavarian Forest Uplands, is the boundary on the south-west.¹

The Bohemian Diamond.—The southern part of this central region is a plateau of resistant rock; undulating country rises to rounded heights, where it forms the water-parting (shown by a dotted line on the regional map) between the Elbe (known in Czechoslovakia as the Labe), which drains Bohemia, and the Morava, which flows southward to the Danube and drains Moravia.

Most of this Bohemian-Moravian Plateau area is drained by the Vltava tributary of the Labe; it has generally rather poor soils and its agriculture is not very productive. The main development is in the neighbourhood of the River Berounka, which enters the Vltava just above Praha (Prague), the capital of Czechoslovakia. Here the folding of the carboniferous strata has preserved Coal Measures which are mined in several places from near Plzen (Pilsen) to near Praha, and iron and graphite are also obtained in the neighbourhood. Aided by these mineral resources, industries have grown up: at Plzen (see map in Fig. 82) iron and steel goods, glass and pottery are produced, and beer is brewed, and at Praha the productions include these commodities, besides chemicals and various textiles.

Praha is also an important trading and financial city; situated at the head of navigation on the Elbe-Vltava river system, it was the chief market and the seat of Government of the old Kingdom of Bohemia, and it has become the capital of the modern State of Czechoslovakia, and now has nearly a million inhabitants.

Although Praha is almost in the centre of Bohemia, it is (like many cities) at the meeting of two types of country, for here the Vltava descends from the plateau to the North Bohemian Trough. In this northern corner of the Diamond, the ancient rocks dip down and are covered by sedimentary or alluvial deposits, save where there have been out-pourings of volcanic material under the edges of the great faults which separate the Trough from the Saxon and Sudetes Uplands.

Consequently, apart from such volcanic heights, the North

¹ In Germany, the term "Sudetenländer," i.e. Sudetes-lands, has been applied to a much wider area than the Sudetes Uplands; indeed, the whole of Bohemia, Moravia and Silesia were included in the term, and the German-speaking people who lived in Bohemia and Moravia were commonly referred to as Sudetendeutsch, i.e. Sudeten Germans.

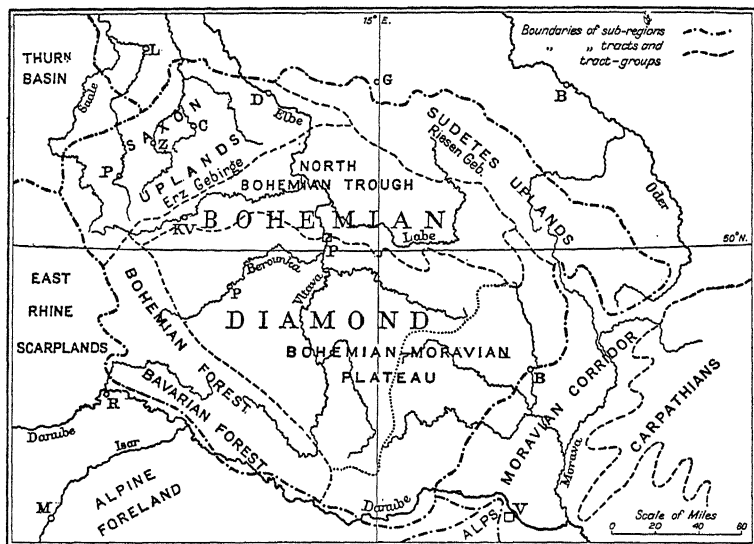


FIG. 49.—REGIONS OF THE BOHEMIAN MASSIF.

Bohemian Trough is lower and warmer than the Bohemian Plateau, its rocks have weathered to fertile soils, and the valleys of the Labe and Ohre (or Eger), which drain it on east and west respectively, are fertile and well populated; beet production and sugar refining are considerable in the Labe area, and fruit and vine growing noteworthy in the Ohre valley.

The faulting of the north-western edge has resulted in mineral springs around which are health resorts, such as Karlovy Vary (Karlsbad). Deposits of brown coal or lignite are worked in the Ohre valley, and these have aided the carrying on of varied forms of industry, while at the base of the Sudetes Uplands there is cotton manufacturing. Hence there are a number of towns, and because of its agriculture, mining, industries and trade, the North Bohemian Trough is a densely populated region.

The Bohemian and Bavarian Forest Uplands.—The mass of gneiss, granite and schist which forms the south-western part of the Massif has been dislocated along faults, running generally from south-east to north-west. In its south-eastern part, however, it is warped rather than broken, and rises more gradually from the Bohemian Plateau, forming rounded heights of about 4,500 feet above sea-level. The higher parts are almost completely clothed with firs and other coniferous trees, but

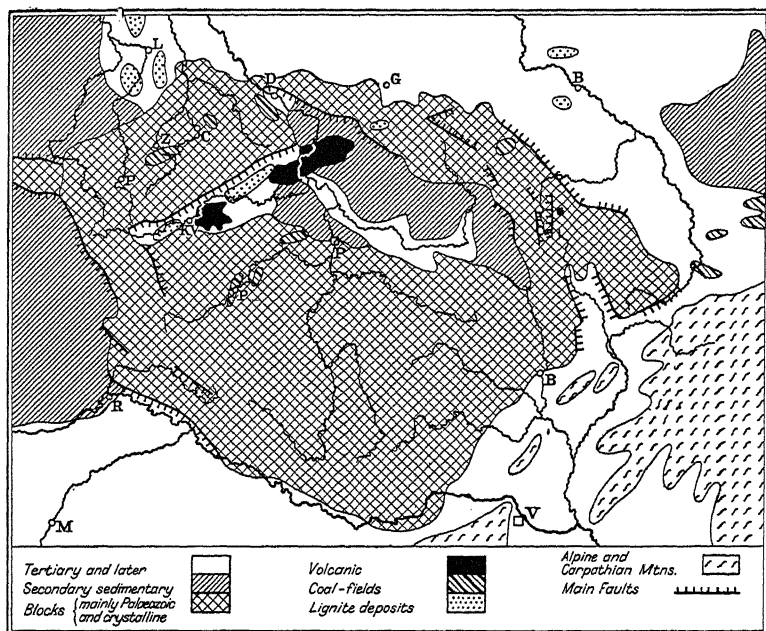


FIG. 50.—STRUCTURE OF THE BOHEMIAN MASSIF.

there are great moors and peat bogs in the broad hollows. A rift-valley separates the smaller Bavarian Forest from the greater Bohemian Forest, and there is thus a double, and almost uninhabited, barrier to communication between the Alpine Foreland and the Bohemian Diamond. In the north-west, the Bohemian Forest is less high, contains small areas of sedimentary rock, which offer more opportunity of settlement, and is more easily crossed.

The Sudetes Uplands.—These have broadly similar structure, relief and vegetation, but have been still more dislocated; consequently, in addition to high areas of crystalline rock, such as the Riesen Gebirge (Giant Mountains) which rise above the tree-line to over 5,000 feet, there are a number of rift-valleys and basins of lower elevation in which sedimentary strata have been preserved. These are farming areas, and also there are two districts which have fuel deposits: one is at the northern edge, south-west of Görlitz, where lignite is found and utilized to produce power transmitted to the manufacturing districts of Saxony and to the northern plains; the other is the small



[Czechoslovak Legation.

FIG. 51.—VIEW IN PRAHA.

Note.—The central building is the "Powder Tower," once part of the fortifications enclosing the city; with the growth of Praha, the tower has been surrounded by the modern buildings which form such a

Lower Silesian coalfield south-west of Wroclaw (Breslau). Earlier, mineral ores were obtained in the Sudetes Uplands, and there are still small manufacturing districts in which textiles are now the chief products.

At its south-eastern end this upland region forms the most easterly bastion of the Central Uplands ; beyond this the ancient rocks dip below younger deposits in the Moravian corridor.

The Saxon Uplands.—At its north-western end the block of the Sudetes Uplands is separated from that of the Saxon Uplands by an area in which faulting has let down and preserved a mass of sandstone which projects north-westward from the North Bohemian Trough towards Dresden. This sandstone is easily eroded and has been cut into a series of cañon-like valleys by the Elbe and its tributaries. Communication between the Bohemian lands and Germany is carried on by the Elbe, and at the northern end of the gorge of the river has grown up Dresden, a great city of nearly three-quarters of a million people. It has also advantages in developing industries because of the mineral resources of the adjoining Saxon Uplands.

From the northern plain this massif rises gradually southward to the faulted edge which is called the Erz Gebirge (Ore Mountains) because of the occurrence of ores of silver, lead, copper and other minerals (refer back to the section in Fig. 4). These were once mined and led to a relatively close settlement of what was then a forested upland. Now the ores are in large part exhausted (though in a valley of the southern slope a recent development has been the working of radium-producing ores) and the forests which supplied timber for raw material and fuel have been destroyed. Other resources, however, have been utilized : the streams were harnessed first for direct power and later for obtaining electrical energy, and Coal Measures were found in basins extending along a belt of " Variscan " graining some distance up the slope ; consequently in the neighbourhood of this belt several large towns arose, including Plauen, Zwickau and Chemnitz. Little coal now remains in this Saxony coalfield, and the greater part of the electric power on which the industries mainly depend is derived from coal, lignite and water-power outside the area. Clearly, geographical inertia has played an important rôle here and enabled the early metal, wood and textile working to continue, and also transferred inertia has greatly widened the range of production. Moreover, beside

the large-scale manufacturing of the towns, smaller-scale industry has survived in villages and even in the houses of the workers. Consequently, except on the highest parts, the Saxon Uplands region is one of the most densely populated areas of Germany, and indeed of all Europe.

The Jura.—The southern end of the Rhine rift-valley is almost closed by the Jura Upland ; between this and the Black Forest is only the narrow valley of the Rhine above Basel, but between it and the Vosges Mountains is the wider Burgundian Gate, or Gap of Belfort, as it is called from the fortress-town which guards this entry between the Rhine-lands and the Rhône-Saône basin.

It is from the Jura Upland that geologists gave to strata appearing here the name of "Jurassic," and geologists frequently illustrate their terms "anticline" and "syncline" from the marked foldings which the limestones have here experienced on

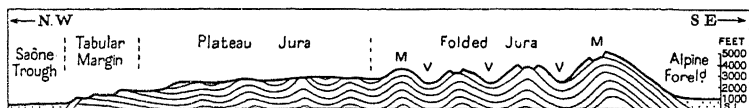


FIG. 52.—DIAGRAMMATIC SECTION THROUGH THE JURA UPLANDS.

the side nearer the Alps, and right across the region in the south (see Figs. 52 and 53). In this region of the "Folded Jura" the structural anticlines correspond with the mountain ridges and the synclines with the longitudinal valleys between them. In Fig. 52 a typical ridge, or "mont," is indicated by M, and a typical longitudinal valley or "val," by V.

The central part of the uplands, however, is of plateau form and is known as the "Plateau Jura." Here the foldings are less marked, and in the past the higher parts of the anticlines were worn down in a process of peneplanation. In the extreme north and north-west are the "Tabular Margins," where the strata have remained little disturbed except when they break down into the valleys of the Rhine and the Saône. The map in Fig. 53 therefore shows three distinct constituent areas of the Jura sub-region.

The Folded Jura.—Considerable parts of the mountain ranges are over 3,000 feet above sea-level, the highest reaching more than 5,000 feet. With heavy precipitation, much of the region

is covered with forests of spruce and silver fir, though above 4,000 feet there are only summer pastures. Forestry and the keeping of cattle are therefore the most widely spread occupations, and Gruyère cheese is a well-known product. In the deep, longitudinal valleys are farming settlements, and for centuries domestic industries have been carried on during the winter. A development of these is the making of watches and clocks; the manufacture is now aided by electricity obtained from the water-power of the streams and is in part organized in large factories; consequently some of the villages have grown into towns, the largest of which is la Chaux-de-Fonds.

Beside these long and fairly wide valleys there are others, the "cluses," which have been worn transversely across the ridges. The cluses are typical narrow limestone cuttings, sometimes with almost vertical sides, and are important as giving a means by which communications are carried on across the great barrier of the Jura Mountains.

The Plateau Jura.—With a general elevation of 2,000–3,000 feet and a dry and infertile soil, this region resembles the Franconian and Swabian Alb; it is mainly a rather bleak pasture-land. In parts, however, glacial deposits from the Alpine ice-sheet give a welcome admixture to the limestone, and woods and the cultivation of barley and oats affords variety to an otherwise monotonous landscape and some additional resources to a scantily populated country.

The Tabular Margins.—This lower area is much more productive and relatively well populated. Indeed, the central part of the north-western margin is such a vine-growing district that it is known as the "Vignoble," while the northern area bordering on the Burgundian Gate and the Rhine valley has industrial development, especially of watch and clock making and of silk manufactures. Besançon, near the exit of the Doubs from this region, is the chief centre of the French horological industry.

The Alpine Foreland.—The Alpine Foreland extends as a unity for about 500 miles in front of the whole northern margin of the Alps, most of it at an elevation of between 1,000 and 2,500 feet above sea-level. Here, between the upraised limestone strata on the north-west, the block of the Bohemian Massif on the north-east and the Alps on the south is a relative hollow,

filled in to a great depth by Tertiary deposits, the "Mollasse," largely sandstones with marls and shales, formed of material worn away from the Alpine strata.

The surface deposits too are mainly of Alpine origin, but of much more recent date, for during the earlier part of the Ice Age, all except the extreme northern angle of the Foreland was covered by the ice and its deposits; the last advance of the ice-sheet, however, with its greater influence on present-day geography, affected only a relatively narrow area nearer to the Alpine margin (see the map in Fig. 53). In post-glacial times the Tertiary sediments of the unglaciated northern angle were largely covered with fertile loess.

The relatively high altitude of the Alpine Foreland is an unfavourable factor, and only the south-western half can be compared with the warmer parts of central Europe. At Geneva, temperatures are very similar to those in the Rhine rift-valley, but at Munich they are almost the same as those of the extreme north-east of Germany (see the table on p. 26). Rainfall is everywhere relatively heavy, reaching about 60 inches on the Alpine margin.

Taking into account climate, relief and surface conditions, we may observe the following constituent regions of the Alpine Foreland: (i) the warmer, south-western portion, which may be termed the *Rhine-Rhône Plateau*, since it is drained by those two rivers; (ii) the *Bavarian Foothills*, the area which was glaciated in the last advance of the ice and now drains to the Danube; (iii) the *Bavarian Plateau*, farther north and earlier glaciated; (iv) the *Northern Danubian Plains* in the angle of that river, and largely loess-covered.

The *Rhine-Rhône Plateau* is in French territory south-west of Lake Geneva, and is German north-east of Lake Constance, but its greater part constitutes the "Swiss Midland," as the Swiss geographers call this most populated and productive section of their country. Most of the area shows the characteristic morainic scenery with low hills, and its valleys have been fairly deeply cut by post-glacial streams. The hollows once occupied by the terminal tongues of glaciers which emerged from the valleys of the Rhine and Rhône are now filled with the waters of Lakes Constance and Geneva. In the long, narrow trough under the edge of the Jura an earlier glacial extension became filled partly by lakes, e.g. Lake Neuchâtel, and partly by the

marshes of the River Aar, now largely reclaimed for farming. The variety in the land-forms and in the soil conditions gives rise to an alternation of fields, meadows and woods, all carefully utilized and supporting a considerable population; the irrigated meadows give predominance to pastoral work, and on this Foreland Plateau (not in the Alpine valleys) is the main production of the Swiss dairying industry. In favourable situations, e.g. on the south-facing shores of Lakes Geneva and Neuchâtel and in the river valleys, wheat and fruit, including the vine, are cultivated.

Moreover, commerce and a considerable amount of industrial work are carried on at nodal points where two sets of routes intersect. The main lines of traffic to and across Switzerland from western Europe enter it by four routes: (i) at Basle; (ii) more directly, past the north end of Lakes Neuchâtel and Biel, to Bern; (iii) past the south end of L. Neuchâtel to Lausanne, then skirting the north shore of L. Geneva; (iv) the valley route of the Rhône from central and south France through Geneva—the commercial centre of the watch and clock industry, and the “cultural capital” of French-speaking Switzerland. Across all the routes run those from south-west to north-east along the Midland Plateau.

Bern, in the centre of the Plateau, is well placed as the capital; it is situated by the River Aar and on the direct railway route northward from the Simplon Pass. Zürich is at the end of Lake Zürich, which half-blocks the plateau, and through this city passes the route from the St. Gotthard Pass to the Rhine rift-valley; it is regarded as the “intellectual capital” of Switzerland, and has a technical college specially famous for its electrical engineering, for the Swiss have done much to advance science in connexion with the development of the water-power of their country. Both in Zürich and in the smaller towns and villages in the district, water-power is greatly used to carry on the manufacture of silk and other fabrics, chocolate and other food-stuffs, as well as many forms of metal goods, including machinery.

The Bavarian Foothills.—The irregular relief of this region is due to its covering by the last extension of the Alpine ice-cap, but on the Eastern Alps this was smaller than farther west, and on the northern margin the area of recent glaciation does not extend far east of Salzburg; also, this area has smaller

lakes in the sites of past glaciers, though moors and peat-bogs are common. There are rather poor growths of pine over considerable expanses of the region, the fairly heavy rainfall aids pastoral work rather than cultivation, and on the scanty resources only a small population can obtain a living. At its eastern extremity the region extends into Austria ; here Salzburg, the " salt burgh," situated where the Salzach leaves the Alps, is famous as the birthplace of Mozart, and its concerts attract visitors from many countries.

The Bavarian Plateau.—Not much better favoured than the foothills region is this plateau, which though mainly in the province of Bavaria extends into Württemberg on the west and Austria on the east. Here the older morainic material is largely covered by the out-wash gravels and sands from the last ice-sheet. The surface has been cut by glacial and post-glacial streams into a series of terraces, and in the valleys the Alpine-fed rivers bring summer floods and prevent the utilization of the land. On the higher parts there are wide beech forests, and others of pines, spruce and firs. Moors are now being reclaimed for pasture or crops for cattle, but there is little cereal cultivation, mainly of barley for brewing or of rye. Most of the settlements are small and widely scattered, except for two great cities on important routes referred to earlier in this chapter. Augsburg was a Roman settlement on the Lech ; it became great by the trade with Italy, and has still fine buildings dating from that time. Munich is situated where the route crossed the Isar between marsh to the north and forest to the south, and intersected an old " salt road " from Salzburg to Augsburg. Munich has been called the capital of south Germany, for in past centuries it was the seat of the rulers of Bavaria and is still the possessor of museums, picture galleries, opera houses and a great university. In recent times it has developed into the chief commercial city of this part of Europe, and with imported coal and with water-power from the Alps and the Isar numerous industries have grown up, brewing being particularly noted ; it has a population of about three-quarters of a million.

The Northern Danubian Plains.—Here on the almost horizontal, loess-covered sediments of sands and marls, good soils have developed, and the region is favoured by the warmer climate, due to its lower altitude. Cereals, particularly wheat, are an important production, and hops are largely grown ; everywhere

there is cattle-rearing, and the farming supports a moderately dense population.

It may be pointed out that the River Danube, which runs near the northern margin of this region, established its course before the present surface of the country had been developed, and consequently in some parts the river flows through the sediments of this plains region and has a wide and often marshy valley, while in other parts the river is in the adjoining regions of more resistant rocks and has cut a valley which is always narrower and is sometimes almost a gorge; here, as so often, a river flows athwart the natural regions of the present stage of the earth's evolution.

QUESTIONS

1. Contrast, in as much detail as possible, the upland areas with the river valleys of the Rhine Plateau.

2. "The Rift-Valley of the Rhine is a geographical unit area." How can this statement be reconciled with the differing characteristics of the country comprised within this valley?

3. Write an essay on the Rhine as an artery of economic life.

4. Describe the country traversed by the Marne-Rhine canal, and assess the value of this canal.

5. Estimate the economic importance of the areas comprising the "Bohemian Diamond" within the Bohemian Forest, Saxon and Sudetes Uplands.

6. Account for the fact that Saxony is one of the most densely populated areas of Europe.

7. Make a regional study of the Jura Uplands.

8. Write comparative notes on the situation and development of any three cities in Southern Germany.

9. Describe and account for the economic development of the Swiss portion of the Alpine Foreland.

CHAPTER XI

THE ALPINE LANDS

General Characteristics.—With a length of some 700 miles, the great curve of the Alpine region extends from the Mediterranean Sea across the southern part of all central Europe, and it adjoins regions which are of different physical character and inhabited by people of varying types. Hence its valleys have been penetrated and occupied by men of several nationalities, and the Alpine Lands are now shared by several States : France, Switzerland, Germany, Austria, Italy and Yugoslavia.

Structure.—As was explained in Chapter I, the Alps constitute the highest and most extensive system of folded mountains of Europe. Here the strata were thrust north-westward and northward against the massifs of the Central Plateau of France and the uplands of central Europe until nappes were piled on one another to a height of miles above the present mountains ; strata which had their roots in the southern part of the Alpine region were even pushed across to the northern side (refer back to Fig. 5).

The lower rocks were metamorphosed into crystalline form, and where the upheavals were greatest, that is, along the middle part of the great curve, the overlying sedimentary strata were worn away. Consequently the rocks of the central zone of the "High Alps" (compare Figs. 5 and 53) are mainly of crystalline structure, while the lower margins, or "Pre-Alps," are formed largely either of limestone of Secondary Age, or of the Tertiary sands, marls and clays known as *Flysch*. The southern zone of sedimentary rocks is missing, however, in part of the western Alps where the crystalline rocks descend steeply to the western side of the North Italian Plain.

In the central zone, besides the metamorphosed and crystalline nappes are areas of older rocks, including masses which are like those of central Europe and show the earlier Hercynian folding. Also in the disturbances in the Alpine region igneous rocks such as porphyry were produced, though recent volcanic outpourings have no important part in the build of this region. These

contrasted elements in the structure considerably influence the present-day geography.

Relief.—In the Alps, however, altitudes are so great that differences of relief are even more important than those of the rock material, and perhaps the best way to appreciate the form of the relief is to study the pattern of the river valleys. Near the outer, i.e. the western and northern, margin of the great curve of the region is a series of almost continuous longitudinal valleys, which accompany the junction between the High Alps and the Pre-Alps along much of its extent (see Fig. 53). This line is well marked in the case of the valley of the River Isère, above Grenoble, and of its tributary the Drac, which meets it at that town; to the north-east, after a break, it is again clearly seen in the back-to-back valleys of the upper Rhône and the Vorder Rhine; after another break it is continued by the longitudinal section of the Inn above and below Innsbruck, and by the longitudinal courses of the Salzach and the Enns. Most of these rivers have their origin in the High Alps, and all of them turn from a longitudinal course outward and cut the North-western and North-eastern Pre-Alps into sections which have their own local names. Some of the valleys, too, have such marked individuality and importance that they have long been regarded as regional units and given special names; e.g. the longitudinal part of the Isère valley is known as the Grésivaudan, and that of the Salzach as the Pinzgau.

Near the inner margin of the Alps which overlooks the North Italian Plain, marked longitudinal valleys are found only in the eastern part. Here are two series, each of less extent than those of the outer margin. One set forms the northern part of the Italian lake region, where, in the Val Tellina, the River Adda flows westward to join Lake Como, whilst farther east are the shorter longitudinal valleys of the Brenta and Piave. The other set lies farther north-east and is within the Eastern High Alps; it is formed of the Val Pusteria, which is drained both westward by the Isarco to the Adige river system, and eastward by the Drava; where the Drava leaves the High Alps to cross the Eastern Marginal Pre-Alps, it flows through a broad and deep depression known as the Klagenfurt basin.

While all these series of longitudinal valleys aid movement between different parts of the Alpine region, several transverse valleys are of great importance as permitting communication

across the mountain barrier. In the west, from the Italian plain near Turin, the valley of the Dora Riparia leads to the Mont Cenis Pass, and thence to the Arc tributary of the Isère, while the valley of the Dora Baltea leads by the Little St. Bernard Pass to the Upper Isère and by the Great St. Bernard Pass to the Rhône. From Lake Maggiore there is access by the Toce valley to the Simplon Pass, and thence to the Rhône, and by the Ticino valley to the St. Gotthard Pass, and thence to the Reuss. From Lake Como a northward route leads over the Splügen Pass to the Hinter Rhine. In the Eastern Alps beyond the Splügen, the most marked transverse route is up the Adige valley as far as Bolzano, thence continuing northward up the Isarco tributary to the Brenner Pass, and across this to a tributary of the Inn, which meets the main river at Innsbruck.

In the broad mass of the Eastern Alps there are also several large oblique valley-lines, with a general south-west to north-east direction—for example, the upper Inn flows through the Engadine valley. In the Eastern Margins part of the Pre-Alps the upper Mur flows from south-west to north-east till it turns at Bruck, while beyond this town the same line is followed, though in the reverse direction, by its tributary the Mürz; beyond the Mürz the line continues across the Semmering Pass to the Leitha tributary of the Danube.

The reasons for the courses of the Alpine valleys can be explained only in part by the present differences of the rock composition; especially in the High Alps their origin may lie too far back in the geological history for its discovery. The form of the valleys, however, and much of their human significance are due to relatively recent glaciation, of which some account will be given later.

Climate and Vegetation.—It is evident that the deeply cut valleys must have climatic conditions very different from those of the intervening highland masses, and these again differ from one another because of their relative elevations; the greater part of the marginal Pre-Alps, for example, is clothed with forests or pastures, while in the central High Alps wide areas rise above the tree line and even to the levels of perpetual snow.

There is, indeed, in the Alpine region a zonal arrangement of climates. The culminating heights which rise above about 20,000 feet form the *snow zone*, and bear no vegetation. The mountain slopes which are below this level, but above 5,000 or

6,000 feet," are in the *alp zone*, snow covered for more than half the year, and with such a short period when vegetable growth is possible that trees cannot exist ; low herbaceous plants grow in great abundance, however, flowering brightly in the earlier part of the summer and constituting the valuable alpine pastures.

Below this level the higher valleys and the upper slopes of the lower ones are in the *forest zone*, which extends downwards to about 2,500 or 3,000 feet ; in the higher parts of the forest zone only conifers are found, the spruce and larch being common, but at the lower levels there are mixed growths of coniferous and deciduous trees, the beech often giving a lighter colour to the woods in the west, and the oak being more plentiful in the east. Deforestation has, however, taken place over considerable areas, and the trees have given place to pastures.

The lowest valleys which have been cut below about 2,500 feet are in the *cultivation zone* ; here fruit trees have been planted and cereals and vegetables are grown. At these lower levels account must be taken of another factor than altitude, for the Alpine Lands have such a wide extent that the different parts adjoin regions with markedly different climates ; hence from these contrasting regions, winds of different character penetrate into the valleys and modify their climatic conditions.

With these differences of climate and vegetation necessarily correspond differences in the ways of life of the inhabitants.

Regional Divisions.—Thus, determining the general character of the various parts of the Alpine region are five main factors : the altitude ; the composition of the rocks ; the situation ; the climate ; and the utilization by man of the natural resources. Taking all these into account, the constituent sub-regions have been demarcated as shown in Fig. 53, and will now be briefly described in turn.

The High Alps.—By contrast with the marginal Pre-Alps, all this medial belt is "high," but the culminating area is the Central Alpine sub-region between the Splügen Pass marking off the Eastern High Alps and the valley of the Dora Riparia beyond which are the Southern High Alps.

The Central High Alps.—The two factors of great elevation and generally crystalline structure determine much of the character of this region, yet here, as throughout the Alpine Lands, it is the valleys, often floored with recent deposits, that count for most in the human geography. The forms and the

resources of these valleys, and also the scenery of the mountains, owe much to the glaciation of the Ice Age. Deep corries, or cirques, with steep walls, were worn out of the uppermost parts of the pre-existing valleys, and by the development of these cirques mountain masses were cut back into irregular sharp-edged ridges, and the ridges were reduced to jagged pyramids, "horns" or even "needles." The valleys were scoured into troughs of U-shaped section, and in parts were deepened to basins separated by rock-bars or by morainic deposits; main valleys were worn more deeply than were the side valleys, which were left "hanging" after the ice had disappeared and the form of the valley bottoms had become visible. Much of the magnificent scenery of the mountains and of the varied charm of the valleys, enhanced by small lakes in many of the basins, is due to past glaciation.

On the greatest heights the Ice Age has remained into the present: on vast snowfields the ice still forms and works its way as glaciers downward into many of the higher valleys. Thus the culminating point of the whole Alpine Highland, the peak of Mont Blanc, towers to over 15,700 feet, and from the icefield of the north-east side of its huge massif the "Mer de Glace" works down to the Arve tributary of the Rhône (see Fig. 54).

Few climbers scale the great heights; but to see these, and to enjoy the beauties of the whole region, many thousands of tourists annually visit the High Alps. They are accommodated in hotels built in the upper parts of the valleys, and in the lower parts small towns have arisen which directly or indirectly depend upon the "tourist industry."

Because the Central High Alps are situated between the Mediterranean Lands and north-western Europe, and because here the highland barrier is narrowest, great trade-routes have for many centuries taken advantage of the passes deepened and smoothed by the ice. The modern railways, however, though they use the same valleys, have avoided the steepest climbs by tunnelling beneath the water-partings near the passes.

Thus the most direct railway route is that which goes northward up the Toce valley, but instead of crossing the Simplon Pass, over which the road has to climb to 6,600 feet, tunnels beneath the adjoining ridge for $12\frac{1}{4}$ miles, and rises only to 2,300 feet; this route, after descending into the Rhône valley, further shortens the distance by traversing the Bernese Alps

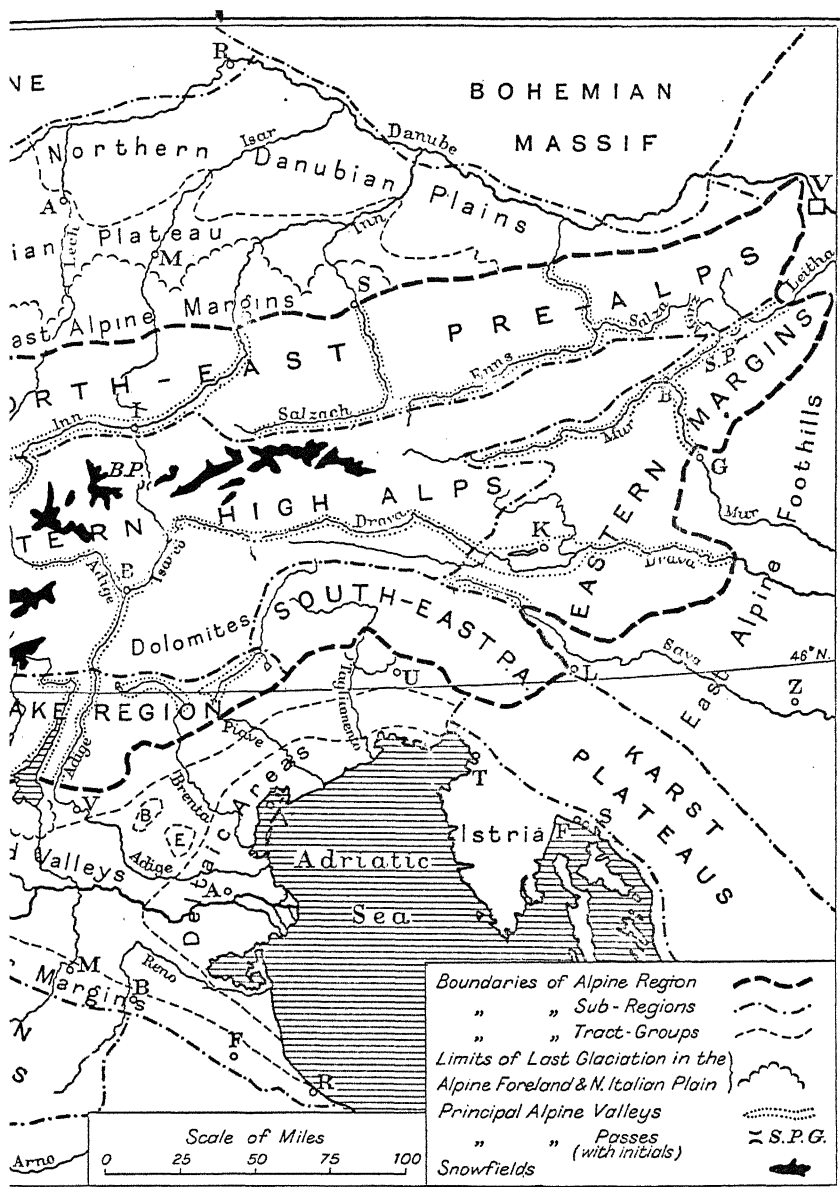
through the Lötschberg tunnel, 9 miles long, to Berne (refer back to Fig. 20). Almost rivalling this crossing in importance, the St. Gotthard route has a shorter tunnel of nearly 10 miles long, but climbs to about 3,800 feet, the road over the pass being nearly 7,000 feet above sea-level. The third of the railways over the Central High Alps has less traffic, for it leads only from the Italian Plain to the middle Rhône valley; it is the Mt. Cenis route and has the additional handicap of a greater climb: the tunnel summit is about 4,400 feet, and the pass, some miles away, is at 6,800 feet.

The railways now use the water-power which is abundantly afforded by the streams fed by the heavy precipitation and melting snows. Where glaciation has caused a break in the normal smoothed valley profile, as at the exit of the hanging valleys or at the rock-bars in the course of the larger streams, power plants have been erected for the production of electricity; cables transmit the current for use within the Alpine region and, to an even greater extent, for transmission to the neighbouring regions of France, Switzerland, Germany and Italy.

While the transverse Alpine valleys leading to the passes are of great importance as lines of communication, the broader longitudinal valleys are the more suited to human occupation. In the Central High Alps, however, only those of the upper Rhône and the Vorder Rhine have any considerable amount of cultivation or settlement of any size; most of the valleys are of the higher kind, in which the people live in small villages and are mainly dependent upon pastoral work.

The mode of life of the people is influenced to an extraordinary degree by the altitude of their environment. Their houses are necessarily built in the lower parts of the valleys, where alone the cold of winter can be supported, and where small patches of ground can yield crops, mainly of quickly ripening barley and vegetables, such as potatoes and beans. These village settlements are generally on the "sunny side" of the valleys, for little light and heat fall upon the "shadow side."

The main resource of the people is their herds of cattle, and smaller numbers of sheep and goats. These animals must be fed upon the higher pastures, and consequently systems of transhumance, i.e. seasonal migrations of animals and man, have developed, the particular times and methods varying according to local conditions. A common practice is that in early summer



AND NEIGHBOURING LANDS.

l of "East Alpine Margins," as printed above south of the Bavarian Plateau.

almost the whole population, with the beasts, leave the village and go up to the meadows of the summer alp, the most productive frequently being irrigated glacial terraces.

On these pastures are what appear to be other villages ; they are groups of small summer chalets, which shelter both people



[French Railways—National Tourist Office.]

FIG. 54.—VIEW OF THE MER DE GLACE.

Note.—The Mer de Glace is the name given to the lowest part of the glacier which descends north-eastward from the extensive massif of Mt. Blanc; in this part the tongue of ice occupies a valley to a width of half a mile, and a length of four miles. Above the part shown in the picture the icefield is much wider, and covers the slopes of the massif which rises to the peak of Mt. Blanc, about six miles to the right of the view here shown.

and animals. Here is made the cheese which is sent down the valleys for use in winter, or for export ; here, too, quantities of hay are gathered for the winter feed of the cattle. As the summer advances, the animals are taken to the high pastures, where they are allowed to graze, accompanied by women or children, while the men reap the hay meadows or the cultivated fields in the lower parts of the valleys. With the coming of winter, the

return migration takes place : the alps are abandoned and the villages are repopulated ; for several months the beasts are shut in their byres and the people largely restricted to their houses.

The winter is a time of almost complete isolation, and until recently, even in summer these interior valleys were largely out of touch with the rest of the world.

Although in the Central High Alps water-power is abundant, minerals are scarce, and in the secluded valleys there has been very little industrial development. Exceptions occur in the Dora Baltea valley and in the valley of the Romanche tributary of the Drac, where there are metallurgical and chemical works based mainly upon the utilization of the local water-power, while anthracite is obtained from a short distance ; also in the relatively broad longitudinal valley of the upper Rhône there are some industrial establishments.

Taken as a whole, however, the Central High Alpine region is one where the natural resources, apart from the attraction which the scenery has for visitors, can support very few people.

The Southern High Alps.—The structure of this region is similar to that of the Central High Alps, but the altitudes are less, there are no areas of perpetual snow, and the scenery is less attractive ; the climate is drier and the pastures and forests are poorer. Although the passes are lower, they are off the main currents for traffic, and the region is less populated.

The Eastern High Alps.—While in general the characteristic features of the Central High Alps are continued on the eastern side of the Splügen dividing-line, there are certain changes to be observed, which become more marked as the region is traced farther eastwards. There is less precipitation and the altitudes are not as great ; consequently there are smaller glaciers to-day and the land-forms show less action of ice in the past.

Moreover, the Alpine barrier does not here lie so directly athwart the great trade-routes as farther west. Hence, in spite of a number of broad valleys and low passes, the Eastern High Alps are crossed only by one route of capital importance, viz. that of the Brenner Pass, which is so low (4,500 feet) that the railway crosses it without a tunnel.

Another feature of the eastern part of the High Alps is that crystalline rocks do not form so large a proportion of the region, and considerable areas are composed of limestone. In some

parts, the almost vertical cliffs which frequently characterize high limestone districts provide scenery rivalling that of the glaciated mountains; this is exemplified most strikingly in the Dolomites area, situated east of the Adige valley below Bolzano (Bozen). Here, upon a great platform of porphyritic rock, forming upland pastures, lie masses of dolomite (magnesian limestone) which reach even into the zone of perpetual snow:



[Swiss Federal Railways.]

FIG. 55.—VIEW OF AN ALPINE PASTURE.

Note.—The richer pastures are those, below the "alp zone," made by clearing the forest growth; this view shows such a pasture area with trees remaining around it. It is on an exceptionally steep slope used, not for grazing, but for growing hay, which is carried down in nets and stored in barns for winter fodder.

what specially distinguishes them is the way in which they have weathered into the most fantastic shapes of groups of pinnacles, described even as "cathedral-like," and the brilliant colour given to parts of them by veins of minerals.

As in the more westerly parts of the High Alps, mineralization has not in general much economic significance. The deposits of most importance are in the extreme north-east; here the iron ore has given its name to the Eisenerz Alps between the Enns and the Mur. Industrial development has not proceeded so far in the east as in the west, and in the High Alps region the

water-power has been less utilized ; the greatest plants are those in the Isarco (or Eisack) valley, near Bolzano, which produce electric current for use in textile and other industries in the Adige valley, and to a greater extent for transmission to the Italian Plain. Forestry and pastoral work are the main occupations of the High Alps, and these support an even smaller population in the east than in the west.

The Pre-Alps.—Lower altitude is the one characteristic common to all the Pre-Alp sub-regions ; differences in situation, structure, climate and human occupation are the other factors which have determined their respective natures.

The North-Eastern Pre-Alps.—On its inner side this sub-region includes the series of longitudinal valleys of the Inn, Salzach and Enns, north of which rise massive limestone heights, except where slaty rocks take their place north of the Salzach. This limestone belt consists of wide plateaus, often of the karst type, broken by the broad transverse valleys of the main rivers and the narrow and sometimes gorge-like cuttings of the smaller streams. The outer marginal strip is formed of Flysch, with lesser heights and more open valleys. As the climate of the valleys is similar to that of the Alpine Foreland, to which they open, cultivation is less favoured than pastoral work ; this and forestry are the main resources of the region. Copper is mined in the neighbourhood of the Salzach, and in several parts salt is obtained and water-power is utilized, but there has not been much industrial development. Trade follows the line of the longitudinal valleys, which are connected by the Arlberg Pass with the Rhine valley ; traffic from the Brenner Pass crosses this line at Innsbruck, whence it has several outlets to central Europe.

The North-Western Pre-Alps.—Very similar as regards land-forms and structure are the North-western Pre-Alps, but their aspect gives them a milder climate, and their lower lands therefore have better possibilities of cultivation, the broad valley of the Grésivaudan producing wheat and maize, vine and fruit trees ; pastoral work, too, has become very important. Glaciation has had a considerable influence on the region, and the scenery and lakes in several of the valleys, particularly in Switzerland, have been a factor in the development of many pleasure resorts. The industrialization of the Swiss Plateau and the adjoining part of France has stimulated the utilization

of the water-power and an associated development of manufactures, the latter being greatest in the valleys of the Isère and Drac, on either side of Grenoble. This town is a centre of metallurgical and chemical industries, of cement making, and of glove manufacture; with nearly 100,000 inhabitants, it is by far the largest town in the Alpine region. The trans-Alpine routes already described, together with the longitudinal valleys, give easy access to all parts of the North-Western Pre-Alps, and help to make it the most densely populated sub-region of the Alps.

The Mediterranean Alps.—This term fitly describes all the Pre-Alpine region drained either directly to the Mediterranean Sea, or by the Durance and smaller tributaries which flow to the lower Rhône in "Mediterranean" France, for the characteristic which distinguishes it from the other marginal Alpine areas is a normal condition of summer drought; this is due to markedly less rainfall combined with the considerable summer heat. The forest-cover is almost lacking, garrigues appear, and there are even areas practically bare of vegetation. Deep cañons appear in the limestone districts, and the scenery has a savage aspect uncommon in the Alps. The human geography, too, is exceptional, for, although pastoral work is the main resource, it is concerned with the keeping of sheep instead of cattle. In particularly favoured spots are cultivated vines, almond trees and even olive trees. Relatively very little traffic passes through the region and the total productivity of the land is small; consequently the population is scanty. The site of the settlements illustrates the distinctive character of the region, for they are frequently on the shady side of the valleys to avoid the great heat of the sun in summer.

At the eastern extremity, the immediate coast of the Mediterranean Sea, commonly known as the "Riviera," may conveniently be regarded as a separate sub-region; its characteristics resemble those of the adjoining coasts of Mediterranean France and the Northern Apennines.

The Piedmont Pre-Alps.—As in the High Alps north of the Dora Riparia, so here the more resistant rocks, in part crystalline, descend directly to the North Italian Plain and longitudinal valleys do not appear. The altitudes are not great, and the uplands have been reduced to a series of ridges separated by the deep valleys of the streams which cross the Piedmont belt to converge upon the plains south of Turin. These valleys prolong

many of the characteristics of the plain into the mountain region, and the people have worked their way into them, continuing their mode of life as far as possible. The water-power of the streams is utilized for the use of Turin and Genoa, and in general the life of the region is closely associated with that of the lower lands of North Italy.

The Italian Lake Region.—After a break from the Dora Riparia to near Lake Maggiore, the Pre-Alps are resumed in the region which may be called the Italian Lake Region from the fact that in it lie a number of large and small lakes, occupying almost a network of transverse and longitudinal valleys. Indeed, the lakes, in the formation of which glaciation has played a large part, were once both more extensive as well as more numerous than they are now, and old lake-bottoms afford valuable areas of pasture or cultivation. The structure is complicated, for crystalline and sedimentary rocks are both found, but the distinguishing character of the region is the co-existence of the valleys and of a climate which combines adequate rain with warmth due to the southerly position and aspect. The climate of the region as a whole is not “Mediterranean,” in spite of the fact that the olive grows in favoured spots; more typical are the plantations of vines in the valleys and on the lake-side terraces, and edible chestnut trees on the lower slopes of the mountains, while the higher parts are largely covered with woods of deciduous trees, especially the beech, or with alpine pastures. The care of the vine and fruit trees and the rearing of cattle are the dominant occupations over most of the region; in the vicinity of the lakes is a considerable tourist industry; water-power is utilized at a number of places and the manufacture of textiles has extended into several of the valleys. It should be noted, too, that the three most important routes across the High Alps have their southern entrances in this region. In the richness of its natural endowment and the relative density of its population the Italian Lake sub-region may be compared with its north-western counterpart.

The South-Eastern Pre-Alps.—Here limestone ridges and plateaus are the characteristic features, and this region forms a transition to the karst uplands of the Balkan Peninsula north-east of the Adriatic Sea. Yet though the ground is frequently dry, there is quite a heavy rainfall, and forests alternate with poor pastures. Quicksilver is obtained from Idria, but in

general the region is little developed, and its population is small.

The Eastern Margins.—The crystalline structures of the Eastern High Alps become lower in the Eastern Pre-Alps and are cut by the valleys of the Mur, Drava and Sava; in parts of these valleys, and notably in the Klagenfurt basin, are sedimentary deposits of Tertiary date. The forests of the uplands give timber for the making of paper and other wood products, while pastoral work and farming of the central European type are carried on in the valleys. The iron of the Eisenerz area is used in metallurgical works in the valleys of the Mürz and of the upper Mur, where in the Tertiary strata lignite is found; lead is mined near the Klagenfurt basin, and here, too, are metal works. Communications are relatively easy, and with Vienna on the one side and Trieste on the other, there is a fair amount of through traffic; hence, with fairly varied resources, the valleys of this sub-region are moderately well populated. The industrial centres of this area are shown on the map in Fig. 82.

QUESTIONS

1. Give an account of the structure as related to the relief of the Alps.
2. Draw a sketch-map showing the principal Alpine valleys, Comment upon their distribution, and group them into types according to their situation and arrangement.
3. Explain how glaciation has affected (a) the scenery, and (b) the utilization, of the Alps.
4. Show where and why industrial development has penetrated the Alps.
5. Describe the railway routes crossing the High Alps.
6. What reasons may justify the name "Mediterranean" being applied to part of the south-western Alpine Lands? How may this area be demarcated?
7. Write an essay on "Pastoral Life in the Alps."
8. Describe the characteristics of the "Italian Lake Region" of the Alpine Lands.
9. Contrast, and account for the differences between, the North-Western and South-Eastern Pre-Alps.

CHAPTER XII

THE DANUBIAN LANDS

Position and Relief.—At their eastern extremities the Alpine Mountains appear to spread out towards the north-east and the south-east; the North-Eastern Pre-Alps are continued, across the Vienna Basin, into the north-western ranges of the Carpathians, while the South-Eastern Pre-Alps pass directly into the mountains of the Balkan Peninsula.

Between these diverging mountains the Central Alpine structures break down eastward first into a region of hill-country, which may be termed the East Alpine Foothills (see Fig. 56), and then into two great subsidence areas, the Upper Hungarian Basin and the Lower Hungarian Basin.

These Middle Danubian Lowlands are interrupted by higher "islands," e.g. the Bakony Forest (Bakonyerdo) and, continuing the north-easterly direction across the Danube, the Matra and other mountains, while farther south are the Mecsek Heights ("M.H." in Fig. 56), and the uplands in the Croatian and Slavonian districts between the Drava and Sava. It is convenient to refer collectively to these areas as the Middle Danubian Uplands; they have a complicated structure and in general represent masses of older rock projecting through the relatively recent deposits laid down in the subsidence basins.

The great highlands and uplands of the Carpathian System form three sub-regions: (1) the wide mass of the North-Western Carpathians, of which the outermost ranges are known as the Western Beskides; (2) the much narrower Eastern Beskides or Forest Carpathians; (3) the almost triangular mass of the South-Eastern Carpathians comprising the Moldavian Carpathians on the eastern side, the Transylvanian Alps and Banat Mountains on the southern side, and the West Transylvanian Highlands, including the Bihor (or Bihar) Mountains, on the western side, while between these three highland masses lies the upland Basin of Transylvania.

Finally, the Hill-lands and Plains of Walachia represent a

filled-in subsidence basin between the Transylvanian Alps and the low plateau of Bulgaria south of the lower Danube.

Climate.—The statistics for Budapest given on p. 26 indicate that in this part of Temperate Europe there are hot summers and rather cold winters, while the rainfall is moderate in amount. But the climate, of course, varies within the region, and while Budapest, because of its almost central position and its situation between upland and lowland, has average figures, the highlands have much colder and wetter conditions and the lowlands are generally warmer and drier.

In the eastern part of the lowlands of the Lower Hungarian Basin there is a lack of rain, especially felt in the hot summer; here aridity shows itself by the occurrence of steppe-like country, known as the Pussta, and even districts of sand-dunes.

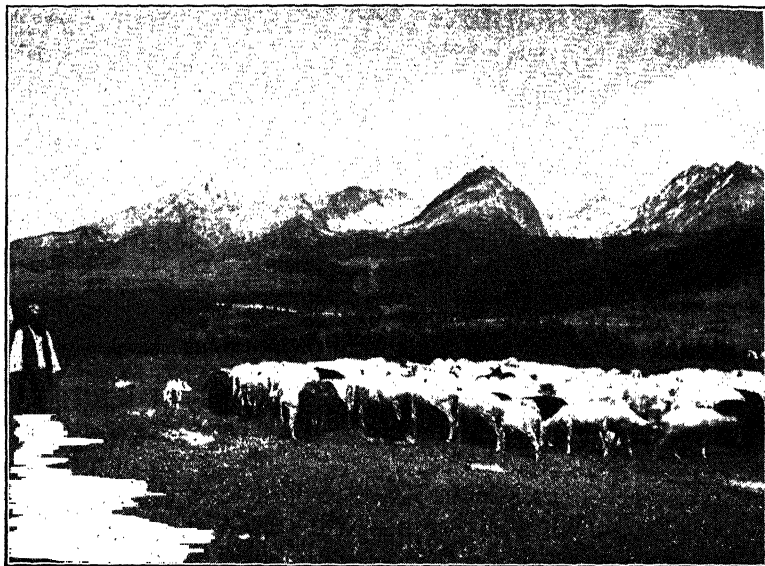
To the south and east of the Transylvanian Alps is another area where the rainfall becomes less than is common in central Europe. The Walachian Hill-lands are fairly well watered and may be grouped with the eastern part of the Balkan Peninsula to form the "Drier South-eastern Lowlands" sub-region of Temperate Europe, marked "10" in Fig. 21.

The climate of the Plains of Walachia, however, as shown by the figures for Bucharest on p. 26, is definitely of the steppe-land type, and therefore this part of the Danubian Lands lies beyond the geographical region of Temperate Europe, and in several respects is an extension of eastern Europe.

The Carpathian System.—We will begin the regional description by dealing with the highlands, and will consider first the *North-Western Carpathians*. Here there is a series of curved highland zones which lie, as it were, one within the other, and are separated by valleys or high basins, in which recent deposits have been laid down. Thus there are the outer and almost concentric curved chains of the Beskides, continued south-westwards by the White Carpathians; south of the Beskides there is the highland mass of the High Tatra, which, at an altitude of about 8,700 feet, includes the culminating point of the whole Carpathian System; separated from this highland by the upper valley of the Vah is the Low Tatra, which, in spite of its name, reaches about 6,700 feet; separated from the Low Tatra by the upper valley of the Hron are lower masses, known as the Slovakian (also known as Hungarian) Ore Mountains. The Vah and Hron flow first westward and then

southward to join the Danube, while back-to-back with their upper courses are the Hornad (Hernad) and Sajo (Slana) which flow first eastward and then southward to join the Tisza (Tisa).

As regards structure, the outer zone of the White Carpathians and the Beskides are composed of the Flysch strata of shales, sandstones, etc., while the High and Low Tatra, the Little Carpathians, which extend south-westward to the Danube at Bratislava (Pressburg), and part of the Ore Mountains are



[Czechoslovak Legation.]

FIG. 57.—VIEW OF A CARPATHIAN PASTURE.

Note.—This is a view in the High Tatra region; in the foreground is a flock of sheep—on the level ground of an old lake-basin.

formed mainly of crystalline rock; the remaining parts of the Ore Mountains are of volcanic origin (see Fig. 58).

The Beskides, modelled from the Flysch rocks of relatively weak resistance, have rather smooth forms; they are forested with beech and firs, and almost the only resource they offer is their timber.

The crystalline areas have bolder outlines; the High Tatra in particular has wild scenery, for here, and to a less extent on the Low Tatra, glaciation has produced the same striking land-forms as those of the High Alps. Forests of firs clothe nearly all the slopes as far as the tree-line at about 5,000 feet, above

which rise almost bare crests and summits ; alpine pastures are rare. On the Tatra Mountains a forest economy is again predominant, and only in the valleys and the high basins is there any considerable population. In these valleys and basins most of the people get their living by cattle- and sheep-rearing and subsidiary agriculture, with small domestic industries, such as spinning and weaving, the manufacture of glass and metal-working. The last occupation is due to the occurrence of silver ores in the volcanic area of the Ore Mountains, while more ancient rocks yield iron, manganese and copper.

The Forest Carpathians are much narrower, for it appears that the great subsidence which has occurred in this part of the Tisza basin has left little of the highland but the Flysch chains of the Eastern Beskides, except that on the edge of the depression, i.e. on the inner side of the mountains, are certain volcanic masses. The parallel ranges are well named the Forest Carpathians, for woods almost completely cover them, and forestry is almost the only occupation ; but on the slopes and in the valleys of the volcanic areas there is more cultivation, and even some vine-growing. In the upper valleys of the Tisza and its tributaries live the greater part of the people of Ruthenia, the easternmost part of Czechoslovakia.

The South-Eastern Carpathians.—The Flysch belt of the Beskides is continued first in the mountains of the Bukovina, i.e. Beech-land ; farther south the Flysch continues in the outer part of the Moldavian Carpathians, and even just around the great westerly bend of the system where it borders the Walachian Hill-lands. Behind the Flysch chains are crystalline and volcanic areas, and there are high and wide basins in the uppermost courses of the Mures (Muros) and Olt (or Oltul, for in Rumania, -ul may be affixed to river names).

While the mountain areas have but a scanty population, which depends mainly on the beech and fir forests, the basins have a very considerable number of inhabitants who cultivate meadows and grow forage crops for their cattle, and in the lower basin of Brasov the town of that name is surrounded by a fertile district in which corn and sugar-beet are obtained.

On the outer margin of the Moldavian Carpathians is one of the Rumanian oilfields (see Fig. 56).

The Transylvanian Basin.—In this great hollow Tertiary deposits of clays and sands, with layers of gypsum and salt,

were formed. The whole region has been cut up into a land of very irregular relief by the Mures and other tributaries of the Tisza, and by the Olt, which cuts through the Transylvanian Alps to the lower Danube.

The higher lands, frequently formed of sandstone, bear woods of beech and other deciduous trees. The lower areas, however, are usually treeless, and consist of arable lands or pastures, on which large numbers of cattle, sheep, swine and horses are reared. The valleys are the most productive areas; some of them have terraces mantled by loess, and on such lands great harvests of wheat and of maize are gathered, while on sunny slopes fruit trees and the vine are cultivated. There are a considerable number of small towns, and the largest, Cluj, has about 100,000 inhabitants.

The Transylvanian Alps.—On the southern side the upland basin is shut in by the broad highland mass of the Transylvanian Alps. Although involved in the “alpine” folds, its structure is in the main that of a great massif of crystalline rock, whose higher parts are in the form of plateaus.

On the southern side of the Transylvanian Alps is the depression now occupied by the Walachian Hill-lands and Plains, and at one period in the geological history rivers from basins in the highland descended so steeply to this depression that they rapidly eroded their valleys and formed great gorges, including those of the Jiu and Olt. The Olt, indeed, cut back its valley till it captured that part of the course which is within the Transylvanian Basin. By such valleys through the highland barrier, railways join Transylvania with the lower south-western lands of Rumania.

Only the greatest elevations of the Transylvanian Alps show jagged outlines due to glaciation, and lower are broad, undulating plateaus which bear alpine pastures; to these large numbers of sheep migrate in summer from Walachia. Below the alpine pastures is the zone of forests of pines and beech, and in the lower and wider parts of the valleys, near the margins of the highland, chestnut trees and the vine are grown.

Near the western end of the Transylvanian Alps is the upper valley of the Jiu and the basin of Petrosani, floored by Tertiary deposits from which lignite is obtained.

A rift-valley separates the Transylvanian Alps from the Banat Mountains, and through this valley, north of Orsova, runs the

railway which connects central Europe with the lower Danubian lands (refer back to Fig. 20).

The Banat Mountains contain a variety of structures : there are ores of iron, copper and other valuable metals and deposits of anthracite. Hence, metallurgical industries have developed at Recita, where railway equipment and armaments are made at the greatest works in Rumania (map on pp. 364 and 365).

South of the Banat Mountains there is no real break between these highlands and their southward continuation across the Danube to the Balkan Mountains. The mountain barrier is cut by the Danube only by a series of gorges, which stretch downstream for about 60 miles till Orsova is reached ; below that town are the rocks and rapids of the Iron Gate, where a side-canal has had to be cut to allow the passage of the small number of river craft which pass from the middle to the lower courses of the river.

The West Transylvanian Highlands.—North-west of the Transylvanian Alps is the valley of the Mures (Maros), a rather wide corridor, fertile and well populated. On the farther side of this valley rises the confused area of highlands and uplands, to which the only convenient general name seems to be the West Transylvanian Highlands. Here the rounded granitic Bihor Mountains reach about 6,000 feet. Igneous rocks and volcanic activity are associated with mineral deposits in two or three places, and small industries have developed at Zlatna. For the rest, the scattered population depends on forestry and farming.

East Alpine Foothills and Middle Danubian Uplands.—

The East Alpine Foothills.—The crystalline rocks of the Alps sink down eastwards and are covered by limestones, sands and clays, in which rivers have carved their valleys and formed a very irregular relief. The forests which cover the ridges consist mainly of beech, and on the lower slopes chestnuts have been planted. The valleys are utilized for agriculture ; and fruit and vines are grown. Where the Mur enters this region is the town of Graz, a market for the exchange of the products of the Alps and the lower lands, and a centre of manufacturing which, with the trade, supports a population of 200,000 persons in and around the town.

On the southern margin the Sava issues from the Alps, and here is the town of Ljubljana ; at this point the route of the Sava valley is crossed by that from the head of the Adriatic Sea.

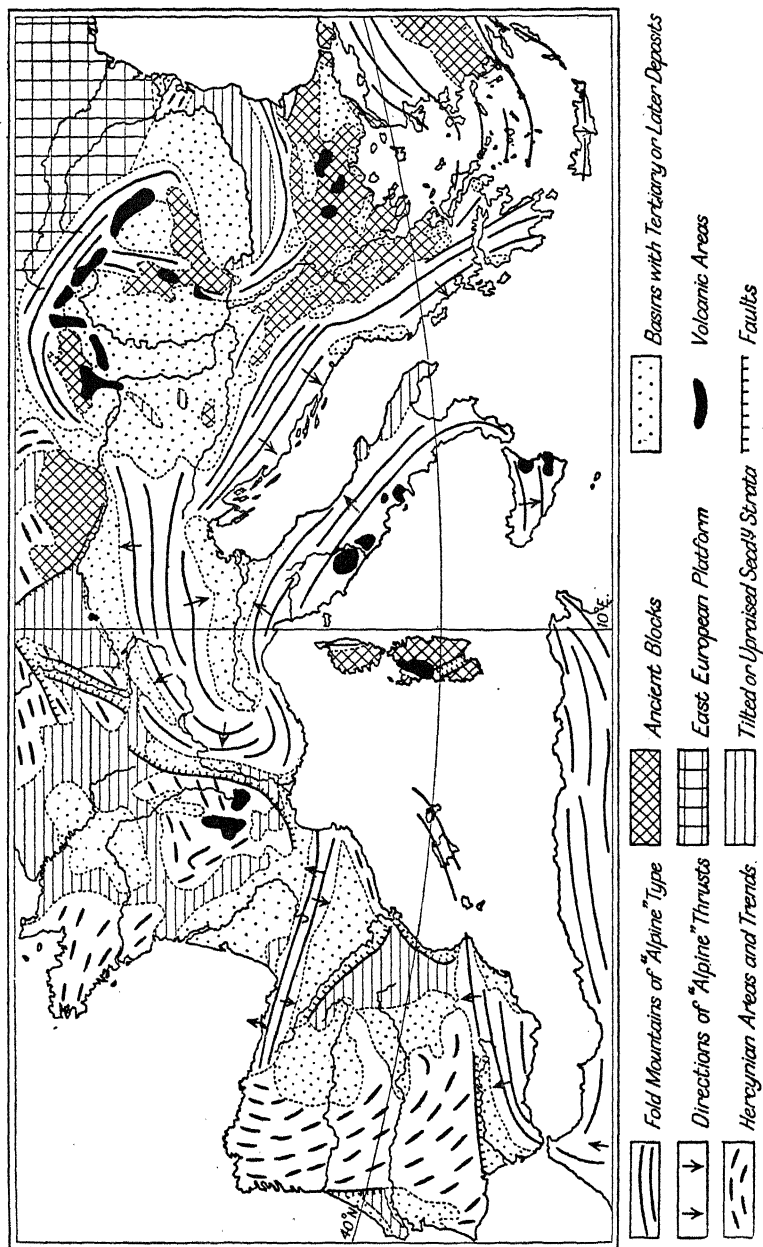


FIG. 58.—STRUCTURE OF SOUTHERN EUROPE.

The Middle Danubian Uplands.—Between the Drava and Sava the Croatian-Slavonian Upland from the Alpine margin stretches south-east; its highest parts are formed of upthrust masses of crystalline rock and are mainly wooded; the lower slopes have orchards and vineyards. From the lowlands north of the Drava rises a small massif, the Mecsek Heights, which also bears woods and vineyards, but the relatively old rock of which it is composed has some deposits of coal; these are of particular value to the State of Hungary, in which there is a lack of minerals, and under the faulted edge of the upland has grown up Pecs, one of the few industrial towns of Hungary.

The Bakony Forest is a somewhat similar upland, whose long, faulted south-eastern edge descends steeply to the depression in which waters of the shallow Lake Balaton have accumulated. Other smaller hill-areas continue the line of the Bakony Forest to the north-east, until there rises a volcanic mass, through which the Danube has cut a picturesque gorge just before the river turns from its easterly to its southerly course above Budapest.

Beyond the Danube gorge the upland continues gaining in width and elevation, and in the volcanic mass of the Matra Mountains it reaches about 3,500 feet. On the northern side of these uplands lignite is found. Near Miskolc, where the River Sajó breaks through the volcanic belt, more lignite is found, and also iron-ore deposits, by which are situated large ironworks. The Matra Mountains and the rest of the upland volcanic belt shut in, on the north-west, a long fertile basin between them and the North-western Carpathians; this hollow is drained by the Rivers Ipel and Sajó to the Danube and Tisza respectively. Its north-eastern end affords a route up the valley of the Hernád, a tributary of the Sajó; in this valley is the industrial centre Kassa (Kosice).

The Middle Danubian Lowlands.—*The Moravian Corridor.*—The name Moravian Gate is applied to the narrow hollow between the Sudetes Upland and the Western Beskides, while to the south-west, between the Bohemian Massif in general and the broken line of ridges which link the Alps with the Carpathians, extends a longer and broader lowland area; this is drained to the Danube by the Morava and its tributaries, and it may conveniently be called the Moravian Corridor. An

extension of the corridor across the Danube is known as the Vienna Basin, since that city is situated on its edge.

Much of the broad corridor is floored by deposits of Tertiary age, on part of which loess has been laid down, and in general it is a fertile region with a wide variety of products. It is not by any means a uniform country, for from the lowland rise lines of wooded, sandstone hills. During the Second World War the Germans developed considerable oil resources in the lower Morava valley east of Vienna.

The break between the Alpine and Carpathian Highlands is of the greatest commercial significance, for it gives an easy route for traffic to accompany the Danube from its upper to its middle course, and to link central to south-eastern Europe. Where the river skirts the north-eastern extremity of the great Alpine barrier is Vienna, situated at the meeting-place of this north-west to south-east route with another at right angles, viz. from the Adriatic Sea and northern Italy through the Moravian Gate to the Baltic lands and north-eastern Europe.

Vienna was the capital, and was situated almost in the centre, of the great Austrian Empire; when the Empire broke up in the First World War Vienna remained the capital, though almost on the frontier, of the much smaller State of Austria.

When it was the residence of powerful rulers, Vienna became a centre of science and the arts, particularly of music; as a seat of Government and a meeting-place of routes it attracted commerce and industry, and its population was over 2 million persons. The small new State of Austria, however, did not require, nor could it support, such a large capital as the old Empire. After the Second World War Austria was occupied by Allied troops, there was political and economic chaos, and Danubian traffic greatly declined; although Vienna was still the administrative centre, its population had decreased to less than 2 millions.

In the Moravian part of the Corridor there are several large towns, notably along the north-western margin, where there are trading centres on the routes into Bohemia and through the Moravian Gate. The largest of these towns is Brno, with about a quarter of a million inhabitants. Here, as well as in other towns along this border of the Bohemian Massif, are industries aided by coal both from the Upper Silesian coal basins and also from those of the Massif.

The Upper Hungarian Basin.—This region almost corre-

sponds to the lowland drained to the Danube between two gorges; the upper is that where the river cuts through the south-western extremity of the Little Carpathians above Bratislava, and the lower is that where it breaks through the barrier of the volcanic uplands above Budapest. In this broad subsidence basin have been laid down from Tertiary times onwards varied deposits, mainly of sands and clays, and including loess; on these are grown wheat, maize, sugar-beet and fodder crops. Where the side-streams meet the Danube, however, there is a great accumulation of sand and mud, which is liable to flooding, and of which only a part has been utilized. The Danube itself divides into three main channels, enclosing a great "island" which has gradually been reclaimed, mainly for keeping cattle and horses and to some extent for cultivation of grain and vegetables.

The Lower Hungarian Basin.—Apart from the emergent uplands already dealt with, tracts of three main types are found in the great basin drained by the Danube between the gorge above Budapest and the narrows which end in the Iron Gate: (i) the West Danubian Plateau, of moderate relief and with a climate of central European type; (ii) the wide East Danubian Plains, in general of less-marked relief and of more arid character; (iii) between and interrupting these regions, the broad and naturally swampy valleys of the Danube and of the lower courses of the Drava, Sava, Tisza, Mures and other smaller rivers.

Just below the gorge where the Danube enters the Lower Hungarian Basin is Budapest, the capital of Hungary. It consists of two parts: Buda is on the high, right bank of the Danube, where the heights come to the river's bank and give a favourable site for an old fortress; Pest is on the low, left bank, and was a market-place for the products of the Danubian Plains. Budapest has spread out widely, having grown particularly with the reclamation and improvement of the plains and the construction of railways which collect much of their produce at this centre; the whole conurbation numbers about one million inhabitants, in spite of the partition of Hungary from Austria.

The West Danubian Plateau is mainly undulating country, rather similar in its build, soils, climate and productions to the Upper Hungarian Basin on the other side of the Bakony Forest. In the southern portion, however, the summers become hotter,

and in some parts the growing of maize and melons becomes characteristic, while in other areas drought may be frequently experienced. Where the Sava enters the Lower Hungarian Basin from the East Alpine Foothills is Zagreb; it is on the route which connects the Danubian lands with the Adriatic ports of Rijeka (Fiume) and Susak.

The East Danubian Plains.—This is the region of which the greater part is sometimes known as the Alföld, while the south-eastern area adjoining the Banat Mountains is called the Banat Lowland. In climate, scenery and the type of land-utilization the East Danubian Plains are transitional to the steppes of southern Russia.

The temperatures tend to extremes, particularly felt when violent winds, blowing without hindrance across the great plains, bring snowstorms in winter and burning heat in summer.

Only on the margins of the region where there is more rain, and in those districts where the soils collect or conserve more moisture, is the water-supply sufficient for tree life; hence over the central areas stretch the open, treeless plains of the Pussta.

Although on the Carpathian borders many streams have cut their valleys, and although the great rivers have clearly marked flood-plains, over much of the country the relief has been smoothed by a thick mantle of fertile loess. From the point of view of the farming resources, however, this area has been reduced by the liability to flooding in certain districts, particularly near the north-western part of the course of the Tisza and between the lowest reach of the Tisza and the Danube (see Fig. 56). Moreover, at a past period sand was formed and blown into dunes which covered much of the area between the Danube and the Tisza and the country in the angle formed by the northernmost part of the course of the Tisza. Now that the climate is not so arid, vegetation has grown upon the sand and checked the movement of the dunes, but they are still the characteristic features of much of those two specified areas.

The fertile loess plains have now become great producers of cereals, but after the harvests are reaped, the stubble-fields again give to the country its steppe-land appearance. Maize is the common food of the people and is fed also to enormous numbers of poultry and pigs; wheat is less grown since the time of the great landowners, but there is a greater variety of crops. Cattle, sheep and horses are widely reared, but they

are now generally fed more upon sown grasses or other crops than upon natural pastures.

The loess lowlands which are liable to flood have been in part protected by dyking and draining, but where the rivers may still spread out over the country, only pastoral work can be carried on.

The sandy regions have also been considerably developed, but the absence of streams in these regions has made this work largely dependent upon the construction of deep wells.

Scattered over the great plains are a number of large towns, or perhaps one might say huge over-grown villages, for although their populations in several cases number about 100,000 persons, they sprawl loosely over wide areas; a large proportion of their inhabitants are the farming families who work the surrounding lands, or are shopkeepers or merchants dealing in the products or the requirements of the farming folk. Some of these towns, however, are also the railway junctions and serve a wider area. The largest are Subotica, just within Yugoslavia, and Debrecen.

The Rivers and Flood-plains.—The Danube and its tributaries flow with complicated meanders or side-channels through broad valleys, normally marshy and frequently flooded, set with great thickets of reeds and clumps of alders and willows. In parts of the basin canals have been constructed across the plain to facilitate drainage, and some of these, like the larger rivers, are, or should be, navigable. But systematic control of the waterways is necessary to keep the courses clear, especially in the later part of the dry summers, and to prevent flooding when the melted snows from the surrounding highlands add greatly to the volume of water in spring. This work would require a unified control of the whole of the basin, but when, in 1918, Hungary was divided up, the river control was disorganized and traffic in general declined.

Budapest, however, carries on a good deal of trade by water, and Szeged, near the junction of the Tisza and the Mures, is the second largest town of Hungary. Belgrade (Beograd), at the junction of the Sava and Danube, is essentially a border city of the Balkan Peninsula.

The Lower Danubian Lands.—The surface conditions give the basis for a threefold division of these lower Danubian lands: (i) Walachian Hill-lands adjoining the Transylvanian Alps; (ii) the Walachian Plains, widening towards the east and including the Dobrogea across the Danube in the angle between the

lowest part of its valley and the delta ; (iii) the broad valley and the delta of the Danube.

The Walachian Hill-lands.—This area is relatively well watered and has been fairly deeply dissected by the streams from the Transylvanian Alps ; consequently there is a marked difference between the ridges, to a considerable extent still forested with oaks and other deciduous trees, and the valleys utilized for cultivation and settlement. In these valleys there are alluvial terraces, on which cereals are grown, while vines and fruit trees cover the slopes.

An important oilfield is worked in the hill-lands adjoining the Transylvanian Alps north of Ploësti ; at this town, as well as elsewhere on the field, are great refineries, and pipe-lines convey the oil for export to the port of Constanța (Constantza) on the Black Sea, and for home use to the river-port of Giurgiu on the Danube, and to the capital, Bucharest.

The Walachian Plains.—Here a scanty rainfall makes itself manifest, and this area, together with the Dobrogea across the lower Danube, must be regarded as a distinct sub-region and grouped with the Steppe-lands of eastern Europe.

Except in the rather shallow valleys in which recent alluvium has been laid down and where cultivation has assumed varied forms, the wide plains are generally covered with loess and have a monotonous appearance.

The better-watered areas are very productive and support many people, who grow wheat and maize for their own consumption, and oats and fodder crops for the sheep, cattle and horses, which they keep in considerable numbers. Other parts are relatively barren, and in the east is a region still known as the Baragan Steppe ; indeed, there are districts bordering the larger valleys where the wind has blown the finer river sand across the plains and formed miniature deserts.

Almost in the middle of the plains region is the capital of Rumania, Bucharest (Bucuresti), from which roads radiate in all directions ; it has become the commercial as well as the political centre of the country, and its population is well over half a million persons.

The Dobrogea.—This is a low plateau formed of a block of ancient rock whose surface is partly covered by loess ; the porous soil increases the aridity due to low rainfall, and the natural condition is that of steppe-land. Although an increasing area

is cultivated or used for pasture, it supports few people, and the only town of any size is the port of Constanța.

The Danube Valley and Delta.—A complete contrast to such districts is afforded by the broad valley in which the Danube meanders and in parts forms a network of channels. In spring much of the region may be flooded.

Lakes, marshes and floods render the wide valley a serious obstacle to traffic, and only one railway crosses the Danube in the whole of its lower course; this is at Cernavoda, on the line between Bucharest and Constanța.

In its northward reach the lower Danube valley widens considerably, and after receiving the Seret and Prut, the river turns eastward and forms a great delta as it deposits its load of mud in the Black Sea. The delta is shut off from the sea by a sand-spit through which the northernmost of the three main channels discharges the greater part of the river water. The middle channel has been straightened and used for navigation, and the chief ports are Galati (Galatz) and Braila, at the head of the delta. These ports export mainly wood from the Carpathians and grain from the plains of Rumania, but are closed by ice for several weeks in the winter.

Owing to the obstacles to navigation in several parts of its course, the Danube has less importance as a highway of communication than its great length might suggest, its value being further diminished by the fact that it flows, not westwards from central Europe to the open ocean, but eastwards to an almost enclosed sea.

QUESTIONS

1. Give a brief account of the relief and the associated structure of the Carpathian Highlands.

2. Show how the physical geography of the North-western Carpathians (including the Ore Mountains) is related to the means of communication and the occupations of the people of this region.

3. Describe the Moravian Corridor (including the Moravian Gate and the Vienna Basin) from the points of view of its internal conditions and its relations with other regions.

4. Make a systematic study of the physical and economic conditions of the Transylvanian Basin.

5. Give an account of the climate, and show how it is related to the farming, of the Upper Hungarian Basin.

6. Compare and contrast the West Danubian Plateau with the East Danubian Plains.

CHAPTER XIII

THE BALKAN PENINSULA

THE Balkan Peninsula appears to be such a tangle of mountains and valleys that before giving a description of its constituent regions, it will be convenient to examine its relief and routes, and refer also to its climate and vegetation, in general.

Relief and Routes.—If the geological structure is ignored, a map showing only elevation of the land would suggest that the South-eastern Pre-Alps are continued behind the Adriatic Coast. Three regions may here be distinguished: the irregular coastlands of Dalmatia; high plateaus of Karst formation, including the Dinaric Alps or Mountains (Dinarske Planina); the mountains and valleys which drain eastward to the Sava and Morava tributaries of the Danube (see Fig. 59). From the Karst Plateau region only one river of any size, the Neretva, drains westward. The only important routes from interior to coast are where the mountain barrier is narrowest, in the extreme north-west; here are the ports of Trieste (Trst), Rijeka (Fiume) and Susak.

Farther south, the coast changes its direction: Albania approaches the "heel" of Italy, and at the Strait of Otranto the entrance to the Adriatic is almost closed. Behind the coast lie the Albanian Lowlands, and behind this region is an almost chaotic group of mountains, valleys and basins, situated partly in Albania and partly in Macedonia, the latter being a rather vaguely defined area politically divided between Yugoslavia and Greece. Through Macedonia the valley of the River Vardar runs almost back-to-back with that of the Morava, and the two valleys together form the main route between central Europe and the Ægean Sea at the port of Salonika or Thessaloniki (refer back to Fig. 20).

A partial submergence of the whole area around the Ægean Sea has caused the drowning of all the lowlands, while the surrounding ranges become lower and break up into peninsulas and islands, e.g. Crete (Krete or Kriti) and Rhodes (Rodi); on the far side of the Ægean Sea they again appear as mountains in Asia Minor (see Fig. 58).

Adriatic, Ionian and Ægean Seas have the characteristic Mediterranean climate.

The temperate type of climate is exemplified in the meteorological



FIG. 59.—REGIONS OF THE BALKAN PENINSULA.

logical records for Sofia. Here, in the heart of the peninsula, and in an enclosed basin 1,800 feet above the sea, are temperature conditions very similar to those of Budapest, for the more southerly latitude is counterbalanced by the greater elevation ;

in respect of rainfall, also, there is but little difference between Sofia and Budapest (see the figures on p. 26).

Yet within this northern or non-Mediterranean part of the Balkan Peninsula the variations of altitude are so considerable that the local climates dependent upon elevation are accompanied by marked contrasts in the natural vegetation. In the valleys and basins this has been displaced or largely modified by cultivation or by the use of the land for pastoral purposes, but the slopes and highland areas are still partly covered by forests, "mixed" at moderate elevations and coniferous at higher levels; an alpine zone of low growths is found in the highest parts of the Dinaric Alps and the Rodopi Mountains.

In the highlands of Albania and Macedonia these climatic conditions and their associated forms of vegetation continue far to the south between the Ægean and Adriatic areas and form an indefinite boundary between the regions which can be clearly distinguished as "Temperate" and "Mediterranean" respectively: even the Pindus Mountains of Greece show rather similar characteristics, although they rise from the clearly Mediterranean part of the Peninsula.

The true Mediterranean climate and life-forms are indeed only found on the lower slopes of the coastal mountains, and in the adjoining valleys and plains. Yet this Mediterranean region is situated so far southward, that on the lowlands it has its full development of winter warmth and summer drought. Accordingly the figures for Athens (as given on p. 26) show remarkably high temperatures both in summer and winter; also, while the total annual rainfall at Athens is only 15 inches, that of the three summer months combined is less than one-tenth of this amount. With such climatic conditions, trees of the evergreen, hard-leaved type form woods in situations where man has not destroyed them, but maquis and expanses of thorny shrubs, such as thistles, are common.

Along the Dalmatian coast the Mediterranean conditions extend exceptionally far to the north, for in the Adriatic Sea currents flow in a counter-clockwise direction and take warm waters northward along the coast, while the great mountain barrier of the Dinaric Alps is at least a partial protection from the winds which would otherwise bring cold air from the north-east in winter time. Yet the Dalmatian coast-lands are occasionally visited by a bitterly cold north wind, the Bora, which comes

down from the Karst Plateau region, and is produced in the same way as the Mistral of southern France.

On the eastern side of the Balkan Peninsula, open both to the north and to the east, the true Mediterranean conditions give place before greater winter cold, and save in exceptional spots the olive extends only as far as the shores of the Sea of Marmara. The Black Sea coast-lands show a transition towards the steppe type of climate, and while woods are found on the higher lands, the chief natural growths of the lower country are drought-resistant shrubs and the spring-flowering herbaceous plants and grasses.

Constituent Regions.—*The Dalmatian Coast-lands.*—In the north-west of the Balkan Peninsula the limestone mountains of the South-east Pre-Alps are continued behind the Adriatic sea-board, with folds running in a north-west to south-east direction (refer back to Fig. 58). The structure is, however, more complicated than this statement alone would suggest, for in the coastal area there have been overthrusts, faultings and sinkings, which have produced the succession of peninsulas and gulfs, islands and inlets, small coastal plains and precipitous cliffs which make up the Dalmatian Coast-lands region.

On either side of the plateau of Istria deep gulfs allow ships to reach the narrowest part of the mountain barrier. Here the ancient city of Trieste flourished while it was the outlet of the Austrian Empire, but when this broke up and Trieste suffered political changes described in Chapter XX, its commerce declined; yet the city still supports about a quarter of a million persons. Similarly, Fiume, now Rijeka, had developed as the port of Hungary, but when that country lost its sea-board the trade was dislocated. Finally, Rijeka passed to Yugoslavia and the port and its suburb Susak are the main entry of that State for sea-borne traffic.

As the highlands rise steeply behind much of the Dalmatian sea-board, there are relatively small areas of productive lowland. The slopes are in part well forested, and timber is sent out from several ports, but cultivation is mainly limited to the islands, the Istrian peninsula, the coastal lowland between Zara (Zadar) and Split, and hill-terraces bordering the sea. Maize, wheat and barley are the cereals; vineyards and olive-yards are scattered along the coast.

Fishing, as well as cultivation, is the work of the people in

many villages ; moreover, an increasing number of visitors from other lands are attracted by the beauty of the scenery.

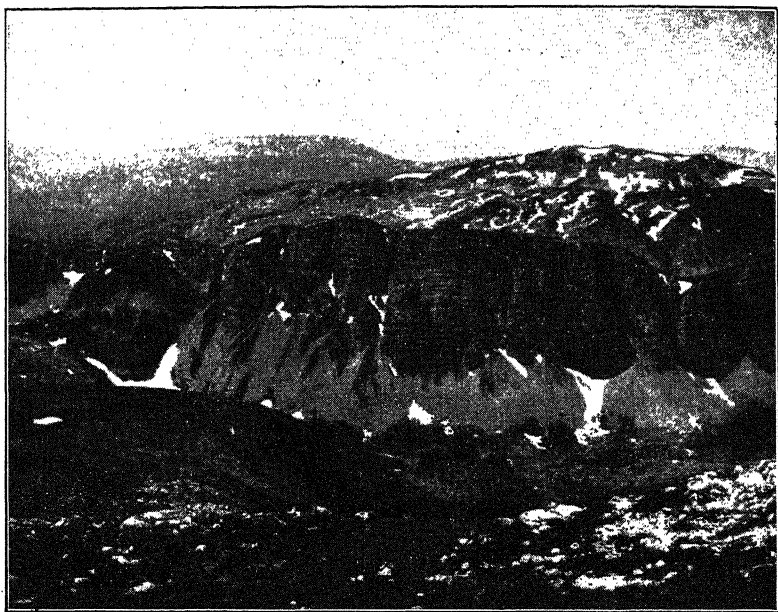
Bauxite (from which aluminium is prepared) is obtained from the Istrian Peninsula, the inner margin of the Zara-Split lowland and at some points farther south ; it is exported from Split and Sibenik. There is but poor railway communication inland from these ports ; hence, although industries are now being developed, the trade and population are not great.

The Karst Plateau Region.—Behind the coast-lands, the fold-mountains have been peneplained and subsequently uplifted, with the result that steep walls of rock bound high plateaus, which in the south reach 8,000 feet above sea-level. The limestone of which they are mainly formed has been but little dissected by surface streams, and much of the drainage is underground. Deep gorges cut the plateaus, and in some of them rivers issue from the depths and after a course of some miles disappear into subterranean tunnels and caverns. The surface is occasionally pitted by dolines, i.e. solution hollows, and in these there is generally an accumulation of soil, reddish in colour and clayey in composition, which has remained when the limestone has been dissolved away.

On the plateau levels the permeable surface is commonly dry, in spite of a heavy rainfall, and with the coldness of the winters conditions do not favour vegetable growth. Poor pastures on which feed sheep and goats, but relatively few cattle, are the main resource of the higher areas, though in dolines and some valleys cultivation can be carried on. There is little mineral wealth, though bauxite is quarried near the Neretva valley, which enables it to be conveyed to the coast for export. The gorge-like valleys generally hinder rather than help communication, and the population is small.

The Croatian-Serbian Mountains and Valleys.—Behind the Karst belt the structure is more complicated ; eastward the limestones are less pure, and are then succeeded by older rocks, including granites. With the greater variety in the bed-rock the soils improve, and with the lower elevation the country becomes more habitable. The higher areas bear forests, in which oaks are specially valuable, both for their timber and also for acorns which give food for the many swine kept in these districts. As the valleys become lower and broader towards the Sava and Morava, agriculture becomes the main occupation :

maize, wheat and potatoes are grown on the level lands, and on the slopes are plum, mulberry and other trees, and vines. The older rocks contain a considerable variety of minerals: zinc, iron, lead and manganese are worked at several places, but although some coal and lignite are also found, there is a lack of suitable fuel for smelting, and consequently there is little industrial development beyond some chemical works.



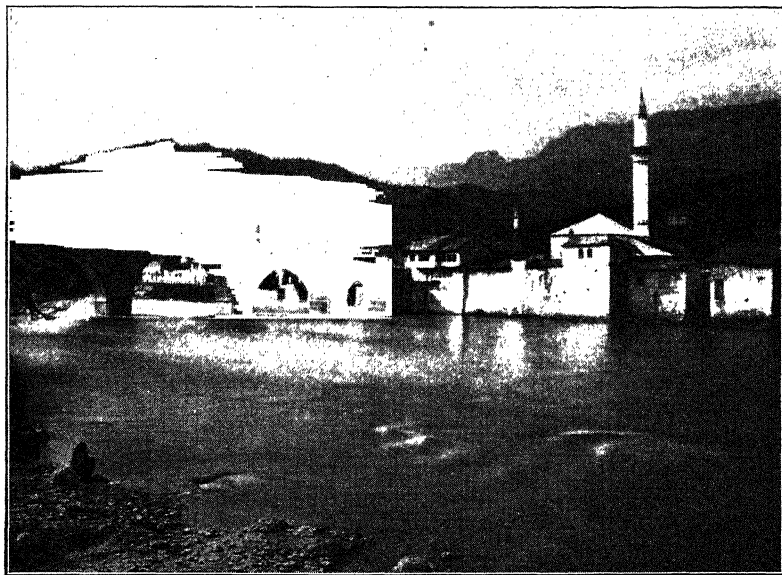
[Royal Geographical Society.]

FIG. 60.—VIEW ON THE KARST PLATEAUS.

Note.—The view shows how the almost level surface of the plateau is cut by steep-sided valleys which make communication very difficult. The photograph was taken in spring when the snow had almost melted, and it may be seen that little vegetation exists. The almost vertical walls of the valley, above the screes, are bare, and expose the strata which form the plateau.

The productive valleys lead down to the Sava and Morava and along the valley of the latter river comes the traffic from the Mediterranean and the East; consequently the district where the two rivers meet the Danube is the focus of routes both from all parts of Yugoslavia and from a much wider area. Beograd, elevated above the junction of the Sava and Danube, is well placed as the capital of Yugoslavia (see Figs. 82 and 83); as a political, commercial and industrial city it is the centre of a conurbation of about half a million inhabitants.

The Albanian Coast-lands contrast with those farther north in showing less effect of subsidence and having considerable areas of recent formation. The region is in part alluvial with swamps and lakes, and in part consists of low hills covered with maquis. In recent years reclamation has allowed the extension of the cultivable land, and farming has now outweighed the winter pasturing for which alone the Albanians earlier utilized the region. Maize is the chief grain crop, while tobacco is grown in



[Royal Geographical Society.]

FIG. 61.—VIEW ON THE RIVER BOSNA.

Note.—This is a scene in the higher part of the "Croatian-Serbian Mountains and Valleys" region; there is here but little agricultural land, and the forests are the chief resource of the area. The minaret shows that in this district of Yugoslavia the people are Mohammedans.

the north and some rice and cotton in the south. Olives and mulberries are obtained, and in the warmer parts oranges and lemons. Towns are few and small: Tirana the capital has only about 30,000 inhabitants; it is joined by a short railway to its port Durrës.

The Albanian-Macedonian Highlands and Basins.—The Karst Plateaus and the adjoining Serbian Mountains end southward in heights, sometimes called the North Albanian Alps, which overlook a series of relatively low areas lying between the north of the Albanian coast-lands and the upper Morava valley. This

series of lowlands comprises the basin in which Lake Shkodra (Scutari) is situated, and the water-parting between the Drin and the Morava with the basins of Djakovica (also called "the Metohija") and Kosovo—marked "D" and "K" in Fig. 59. These afford a moderately easy way across the highlands, and collectively they have been named the Albanian Gap.

Towards the south and east of the Balkan Peninsula appear more of such basins, known as polyes. They have been formed probably by subsidence as well as solution; they are often bounded by steep walls, and in them water tends to collect. Lakes have commonly resulted, and in some cases still remain, e.g. Ohrid and Prespa on the borders of Albania and Macedonia. In most cases, however, the lakes have disappeared and their beds yield soils which, though liable to floods, give almost the only extensive areas for cultivation and settlement in the highland regions.

South of the Albanian Gap there is a complicated mass of mountains, difficult to cross. The western part is Albanian, and here the structure is like that of the Dinaric Alps to the north. The eastern part is in Macedonia, where granites and other crystalline rocks predominate, as the area forms part of the great mass of ancient rock which lies between the folds of the west of the Balkan Peninsula and those of the Balkan Mountains proper; in this block, sometimes known as the Rodopi Massif, minerals have been found, and there are also considerable areas of recent eruptive rock.

The highlands, especially in the Albanian portion, have an irregular relief, and the country often has a wild and savage appearance. It is mainly used for the summer pasturing of sheep, goats and cattle. The polyes are the sites of all the important settlements; in them are grown maize and wheat, the vine and fruit trees, while in sheltered areas in the south even olives are produced.

Petroleum has been found in the marginal district between the highlands and the southern part of the Albanian coast-lands; some copper is obtained, and chromium and other metals are known to exist in the mountainous parts of the region, but mining and industries have not been developed to any considerable extent.

The Balkan and Rodopi Mountains.—The Balkan Mountains which curve southward from the Danubian gorges increase in

height till, where they run parallel with the river, the highest ranges attain a height of nearly 8,000 feet. The foldings have involved rocks of varied age and composition, and in them are some mineral ores and lignite deposits. In the small portion belonging to Yugoslavia in the north-west considerable amounts of lignite and copper are mined.

The ranges are cut by a number of river valleys, and half a dozen passes lead roads across from the north to the south of Bulgaria. Forestry is carried on, and animals are sent up to pasture during the summer, while in the valleys there is mixed farming.

The Rodopi Mountains rise higher, and since they are relatively flat-topped there are wide elevated areas on which the only vegetation is of the sub-alpine or alpine type. The slopes, however, are well wooded, and forestry, with the production of charcoal and the sawing and working of timber, is the principal resource of the small population. There are a few fairly wide valleys, notably that of the River Struma, but in the main the upland edges are cut only by small streams.

The *Sofia Basin*, situated between the Balkan and Rodopi highland regions, is on the great route from central Europe to Istanbul and the East, while the Iskar and Struma give passageways to northern Bulgaria and the Ægean Sea respectively. Due to this nodal position, the city of Sofia has had a long history, and it is now the capital of Bulgaria, with 300,000 people.

The soil conditions of the elevated basin, however, are not favourable and the climate may be rather severe; the chief grain crop is a hardy mixture of rye and wheat, and potatoes and vegetables occupy much of the cultivable land, though in the more sheltered positions there are extensive orchards.

The Eastern Lowlands.—This is the part of the peninsula which is distinguished by steppe-like or almost steppe-like conditions. Together with the Walachian Hill-lands, it forms part of the sub-region of Temperate Europe called the “Drier South-eastern Lowlands,” marked “10” in Fig. 21, and it comprises the following areas. The *North Balkan Low Plateau* is formed of almost horizontal layers of limestone, which give a uniformity in scenery, although in parts layers of clay and loess add greatly to its fertility; on the great plains maize and wheat are produced in large amounts. Only in a belt of foot-

hills adjoining the Balkan Mountains is there any marked variety in relief and any extensive growth of trees.

The *Black Sea Coast-lands* are varied in structure and relief. The higher lands have oak woods, low scrubby growths and poor pastures used mainly for sheep, but the lower lands are cultivated with barley, wheat and maize, and fruit trees. Situated by inlets due to subsidence are Varna and Burgas, the two ports of Bulgaria; the latter has the greater amount of trade because of its more direct railway communication with the chief towns, Plovdiv and Sofia.

The *Plovdiv Basin*, open only to the east, has rather extreme temperatures and a low rainfall; consequently its most prosperous agriculture depends on the natural water-supply being supplemented by irrigation. With this help the meadows yield good pasture, the fields bear wheat, tobacco and even some rice, and the slopes have orchards of warmth-loving fruit. Plovdiv, on the banks of the River Maritsa, and on the main commercial route, has over 100,000 inhabitants.

Communicating with this basin, and sheltered from the north by the Balkan Mountains, is the narrow but very fertile valley of the upper Tunja; it is famous for extensive gardens of roses, from which scent is distilled.

The *Edirne Basin* is the southernmost of the steppe-like Eastern Lowland regions. Cultivation, mainly of barley and rye, has not widely developed, except in the river valleys; in these, however, even cotton and rice are grown to a limited extent, for the summer heat is considerable. The basin is drained by the lower River Maritsa, which forms the boundary between Greece and Turkey; Edirne, at the junction of the Tunja and the Maritsa, is in Turkish territory.

The Marmara Region.—The main significance of this region, situated along the north-western shores of the Sea of Marmara, lies in its position at the crossing from one continent to another.

Near the southern end of the Bosphorus, a small inlet known as the Golden Horn gives good harbourage, and here in ancient times arose the city of Byzantium, later called Constantinople; when the Roman Empire was divided into two parts in A.D. 395, the city became the capital of the Eastern or Byzantine Empire as well as the centre of the Eastern or Greek Church. For many centuries it was the focus of the civilization and trade of

all the lands around the Eastern Mediterranean. In A.D. 1453 it was captured by the Ottoman Turks from Asia Minor, and its trade declined; in recent centuries its chief importance was in being the capital of the Turkish Empire, which extended far into Europe. When, after the war of 1914-18, the Turkish territory in Europe was restricted to its present small limits, the capital of Turkey was removed to Ankara in Asia Minor, and the old capital, now known under its Turkish name of Istanbul, lost much of its significance.

Yet Istanbul still has a population of nearly a million, if the suburbs of Galata and Pera on the opposite site of the Golden Horn, and Uskudar (Scutari) across the Bosphorus, are included. The city has a markedly Oriental appearance, with the numerous cupolas and tall minarets of its mosques.

The Greek Region is that which is most truly Mediterranean in character. On the mainland it almost coincides with the political territory of Greece, and it includes the Ægean islands.

The region is composite, in that it is formed in the main of three types of country, distinct in character, though intricately associated in situation. First, there are the mountainous areas, broadest and highest on the mainland, but reappearing on the larger islands. They are usually rugged in their relief, and have only a sparse population living in small villages in the valleys; on the heights are summer pastures for sheep and goats which winter in the adjoining lowlands.

In marked contrast are the low and level basins; the largest of these afford relatively extensive lowlands, e.g. by the lower courses of the Struma and Vardar, by the northern coasts of the Ægean, in the plains of Thessaly (marked "Th" in Fig. 59) and by the Ionian Sea. They have the possibility of considerable agricultural production; wheat, and to a less extent, barley and maize, are grown, particularly in Thessaly, and tobacco on the northern plains. But marshes have in the past covered extensive areas, and, as in many of the Mediterranean lowlands, the mosquitoes which bred in the marshes made malaria a very serious scourge to the population. Now drainage is being carried out, malaria is being reduced, and cultivation, even including in some parts cotton, is being extended.

The third important type of country is that of the hilly coastal areas of the mainland and the islands. Such areas may have small lowlands, though for long stretches they are formed by

slopes terraced for cultivation. Cereals are grown, but the characteristic production is of olives, rice, grapes and other fruits. The grapes are in part used for the making of wine, in part dried and exported; currants are obtained mainly from the southern shores of the Gulf of Corinth (whence the name "currant" was derived) and the neighbouring coast-lands of the Ionian Sea, and sultanas mainly from the island of Krete.

The other fruits include figs, locust beans, oranges, mandarines, and the lemons which are grown chiefly in the southernmost districts. On the northern shores of the Ægean Sea mulberry trees are grown and cocoons of silk worms were sent to mills in western Europe; now cultivation and export of tobacco form a much more important resource.

Minerals, including iron, emery, magnesium, chromium and lead, are obtained in several parts of Greece, but in no large quantities; industrial development is handicapped by a lack of fuel, though lignite is found on the island of Evvoia (Eubœa) and the neighbouring mainland.

Fishing is another resource. Moreover, the people are further encouraged to become seafarers by the fact that the land traffic is hindered by the highlands of the interior and by mountainous spurs which reach the sea and almost isolate the more productive basins; on the other hand, the numerous islands facilitate maritime communication between all parts of the Ægean region. The greater part of the population of Greece lives in the coastal lands, and here are situated the capital and the largest trading towns.

Athens was at first only a small city-state in one of the small basins bordering the Ægean Sea, but in it art and science developed in almost miraculous fashion in those centuries preceding the Christian Era in which Greece was the centre of a civilization to which mankind owes more than to any other. Traces of the former greatness are still to be seen in the temples and statues remaining in and near the city, but for a very long period Athens shared the decline of Greek civilization and power. With the independence and growth of modern Greece the capital has also grown, but the manufacturing which has recently begun to develop has not added to its beauty, although it has increased its population. Being a few miles from the sea, Athens has as its port the Piræus, and the whole conurbation has about a million inhabitants.

The chief port of Greece is Salonika ; its trade is considerably increased by an arrangement by which Yugoslavia has a " free zone " through which goods to and from that country can pass without paying Customs duty to the Greek Government.

QUESTIONS

1. Discuss what truth there is in the dictum : the Balkan Peninsula turns its back to Europe and looks to the Orient.

2. Describe the chief trade-routes across the Balkan Peninsula, and show how they are related to the physical geography.

3. Give an account of the mineral resources of the Balkan Peninsula. How far has their relatively slow utilization been affected by physical conditions and by human factors ?

4. State the limits, and describe the character and productions, of the " Mediterranean climate " areas of the Balkan Peninsula.

5. Describe the coastal areas and their hinterlands as they would be observed on a journey along the eastern Adriatic Sea from the Strait of Otranto to Trieste.

6. State the location of the chief farming areas in the " Temperate climate " region west of the Balkan and Rodopi mountains ; give an account of these areas and the work carried on in them.

7. In what ways, and to what extent, may the north-eastern part of the Balkan Peninsula be considered as transitional to the Steppe-lands of eastern Europe ?

8. Make a comparative study of the four cities : Athens ; Belgrade ; Istanbul ; Sofia.

CHAPTER XIV

THE ITALIAN PENINSULA AND NEIGHBOURING REGIONS

The North Italian Plain.—Between the Alps and the Apennines is situated the great lowland sometimes called the Plain of Lombardy, but better named the North Italian Plain. It is, as it were, a half-way house between central and southern Europe, for while on the one hand its climate (as explained in Chapter II) is of the Mid-Temperate type, on the other hand it is so cut off from the north by the Alps and so easily accessible from the south, that in its human geography it is closely bound up with the Mediterranean lands.

The North Italian Plain has been greatly influenced by the adjoining Alpine region, for the lowland occupies a great depression within the curve formed by the Alps and Apennines, and its surface is formed mainly by deposits brought down from these mountains and particularly from the Alps. Indeed, the differences between the various tracts constituting the North Italian Plain are largely due to the nature of these surface deposits; they are generally more elevated and of coarser and drier material on the margins, and become progressively lower, finer in texture and wetter towards the centre and near the Adriatic Sea.

Constituent Regions.—The “*Morainic Amphitheatres*” which are grouped round the southern exits of some of the larger Alpine valleys, from the Dora Baltea to the Tagliamento, recall the regions of recent glaciation on the northern margins of the Alps (see Fig. 53). The “amphitheatres” have outer rings of irregular, and sometimes quite high, end-moraine surrounding areas of clayey ground-moraine; the latter are sometimes wet and moor-like, but because of the southern aspect and lower altitude they are more responsive to cultivation than the northern Alpine margins, and indeed are in parts so sheltered from winter cold that fruit trees and even olive trees can be grown.

A continuous belt along the whole of the Alpine border of the plain, and another on the eastern part of the Apennine border,

may be termed the *Drier Margins*, as compared with the better-watered interior. On these margins, rather coarse material has been spread out by the streams; it is often permeable and the water-table lies well below the surface, which is therefore dry and not remarkably fertile. In parts there are still some heath-lands or wood-lands, but most of the land has now been farmed. The productions are those which one would expect from the fact that the climatic conditions resemble those of the Rhône valley in the same latitudes on the other side of the Alps: maize is the chief grain crop, followed by wheat; mulberry trees are grown for the culture of silk-worms, and there are vineyards and orchards.

The *Well-watered Plains* are of lighter material, and the soil is generally a fine and fertile loam. Much of the natural inequality of the surface has been obliterated in the construction of extensive irrigation systems. North of the Po, the water is derived from innumerable pools known as *fontanili*, which are mostly artificial reservoirs, fed by water which seeps out from below the coarser material of the drier margins, where this overlaps the finer deposits along the northern edge of the well-watered plains.

The water is available during the whole year, and during the winter and spring it has been kept at a relatively high temperature while beneath the surface of the northern margins. Consequently its warmth is very useful when in spring it is allowed to spread out over the meadows of the lower plains; it aids the rapid growth of the grass, which is cut for hay six or eight times during the year. Cattle are stall-fed on this fodder, and milk and cheese are important products of the plain.

The streams, too, are used for irrigation, and the natural drainage system has been supplemented by canals; some of these are employed also for transport. Irrigation is necessary for the flooding of fields for rice, grown either as an annually repeated crop or in rotation with others, such as maize and flax. There are also unirrigated areas dependent on the rainfall, and these also yield a great variety of products.

It is in this most thoroughly cultivated and extraordinarily productive region that the same field may be planted with lines of mulberry trees, with vines trained along them, and grain growing between the rows.

The *River-valleys* of the larger streams are generally broad and

liable to flood ; they are therefore less used and are avoided as building sites. The innumerable large villages and towns of all sizes in this densely populated plain usually stand away from the rivers ; it is noteworthy that between Turin and the sea there are only two cities on the River Po, and these, Piacenza and Cremona, are situated on the high banks on the outer side of the river-meanders.

The *Deltaic Areas* are of relatively recent formation, as is



[E.N.A.]

FIG. 62.—VIEW ON THE NORTH ITALIAN PLAIN.

Note.—Men are preparing a rice-field ; it is a shallow, rectangular basin irrigated from the canal shown in the background. On the banks are planted rows of pollarded poplar trees—a common feature of the landscape of the plain.

shown by the fact that Adria, from which the sea was named, is now 14 miles inland. The Po has seven distributaries ; these have deposited so much material that the other streams which once joined the Po, such as the Adige and Reno, have been forced into independent courses.

The rivers of this region have to be dyked to prevent disastrous floods, and reclamation like that of the Dutch polders has been undertaken. By the coasts, sand is washed southward by the counter-clockwise currents of the Adriatic, and sand-spits and dunes have cut off great lagoons.

The "*Hilly Enclaves*" are exceptional areas in the North Italian Plain. The largest is that of Montferrat, which may be thought of as a detached and lower portion of the Northern Apennines; on its rounded slopes are orchards and vineyards and "*Asti*" wine is named from a town on its southern border.

In the north-eastern part of the plain rise the Berici and Euganean Hills; they are formed partly of volcanic rock, from which trachyte was taken to build the palaces of Venice amid the coastal swamps and waters.

Communications and Cities.—The largest settlements are commercial centres whose positions are to a considerable extent related to the Alpine valleys which open upon the plain. The largest city, Milan, with well over a million inhabitants, is at the meeting-place of routes from the Simplon, St. Gothard and Splügen Passes. Its nodal position, with roads and railways constructed from it to all parts of northern Italy, has helped to make it the most important commercial and industrial centre of the whole Kingdom. Water-power from the Alps has aided in its manufactures of silk and other textiles, and in engineering of all kinds; there is also much preparation of food-stuffs, and the city is a centre of book-production and publishing.

A similar development has occurred at Turin, where the route from the Mont Cenis Pass reaches the Po; here, also, water-power from the Alps is used for a similar group of industries, including the construction of motor-cars and associated rubber manufacturers. The population of Turin is about three-quarters of a million.

Where the more easterly and commercially less important Alpine valleys open upon the plain are a number of smaller cities, including Verona on the Adige.

An ancient route led from the crossing of the Po at Piacenza, south-eastward along the Dry Margins of the Apennines to the Adriatic coast, and along this route a series of towns grew up, including Parma, Modena and Bologna. The last-named city is the most important, for it is the crossing-place of the easiest route from Northern Italy, by the La Futa Pass through the Apennines, to Florence, Rome and southern Italy.

The one port along the difficult Adriatic shore of the plain is Venice, on the "safe" side of the Po estuary away from the current-drifted silt. Here, in the early Middle Ages, refugees from a Hun invasion of the mainland made a settlement on an

island. Later, Venice became the centre of trade with the East and arose to political as well as commercial dominance in the eastern Mediterranean. When the fall of Constantinople stopped the trade, the power of Venice declined, but its past wealth is still shown by the palaces standing by the canals which serve as streets. More recently the trade of Venice has revived, and there are plans to connect it by a ship-canal to Milan; at present it has a permanent population of nearly a quarter of a million, and many visitors are attracted by its historic and architectural interest, and by the fashionable resort of the "Lido," the sand-spit which encloses its lagoon.

Peninsular Italy shows "Mediterranean" characters, with the exception of the north-facing part of the Northern Apennines. We have earlier made a distinction between the cooler part of the Mediterranean region in which the olive is the typical plant and the warmer part where the citrus fruits flourish; following this distinction we may separate the peninsula into two sub-regions, central Italy and southern Italy, as shown in Fig. 63.

Central Italy.—The Apennines, the "back-bone" of Italy, consist of broad uplands which occupy a large proportion of the peninsula. In central Italy they curve round so as to leave a narrow coastal lowland by the Adriatic, while within the curve there is a wider area of generally hilly country facing the Tyrrhenian Sea; thus there are three well-contrasted tract-groups in central Italy.

The Northern and Central Apennines.—The north-eastward curve of the Apennines shows some similarity with the outer, north-western portion of the curve of the Alps, for in both cases there have been overthrusts towards the outer side of the folded areas, and in both cases the rocks are largely either limestones, or flysch comprising sandstones, marls or clays. In central Italy the Apennines show the characters of more recent uplift, and broad terrace-like plateaus are divided by relatively narrow valleys.

The *Northern Apennines* are transitional in character, for they are "Mediterranean" only in the sheltered Riviera region. The climatic statistics for Genoa (see the table on p. 26) show that the winter temperatures are remarkably high for the latitude, and to such a degree that even citrus fruits here find an exceptional possibility of growth in the northern Mediterranean region. As in the French part of the Riviera, the tourist

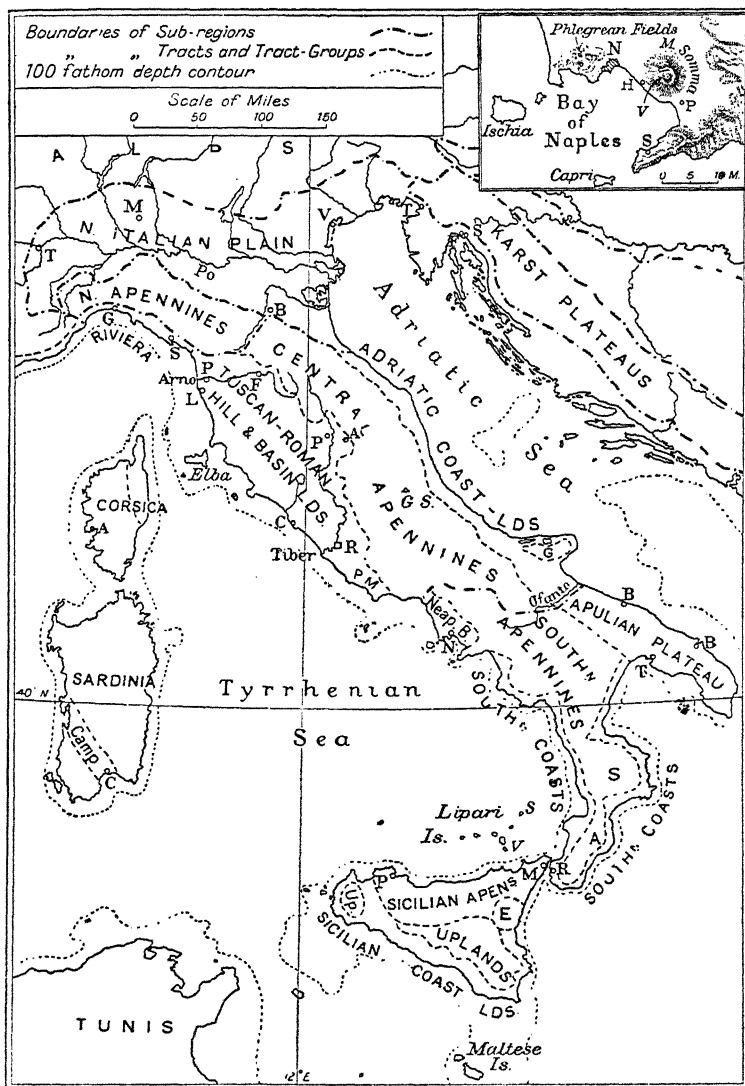


FIG. 63.—REGIONS OF THE ITALIAN LANDS.

industry has led to the rise of a chain of large and small settlements along the coast. Genoa is the great port, for behind it the Giovi and Bocchetta Passes give easy roads across the Apennines to the North Italian Plain, and thence by the Alpine routes to

central and north-western Europe. Around Genoa have grown up industries, especially those connected with ship-building, and the population of the port numbers about 700,000 people.

In a sheltered harbour farther east is the naval dockyard of Spezia. Near here the limestones of the Apennines have been metamorphosed into marbles which at Massa and Carrara have been for many centuries quarried and exported for buildings and statuary.

The Central Apennines.—These mountains rise to over 9,000 feet in the great limestone range of the "Gran Sasso d'Italia," the highest point in the peninsula. The more elevated areas are generally almost bare, and even at rather lower elevations there is little forest remaining; below the waste or macchia-covered heights there is a zone of chestnut woods, and the valleys are cultivated. In the flysch areas the peasants are menaced by land-slides and mud-streams, which result from heavy rainfall on the heights washing down unconsolidated marl and clay into the valleys. These "frane" rank with earthquake shocks as being as destructive in central Italy as the floods in the northern river-valleys, or as volcanic outbursts and earthquakes in the south.

On the plateau areas there is summer pasture for sheep and goats, and "transhumance" between the uplands and the lowlands on both sides of the peninsula is a feature of the life of central Italy. In the Apennine region east of Rome are deposits of bauxite, which are important as giving supplies of aluminium to Italy, a State rather lacking in mineral resources.

The Adriatic Coast-lands.—The low terraces of the eastern Apennines gradually descend to a coastal plain, which is very narrow for most of its length. It is, however, important in affording an easy land-route from the north to the south-east of Italy, and thence by sea to the Orient. In this part of the peninsula the coast is regular, with the exception of the spur-like promontory formed by the upraised and karst-like limestone block of Monte Gargano.

The Tuscan-Roman Hill-lands.—This is a region of complicated structure and correspondingly varied relief and character. There are hilly districts of ancient and crystalline rocks in which some iron, lead, quicksilver and other minerals are found; to these areas may be added the adjacent island of Elba, which yields iron ore. There are also districts of eruptive rock, and

others where recent volcanism has occurred ; the heat obtained from vapour from " fumaroles " is utilized in electrical power-stations. The Alban Hills south of Rome and the small lakes north-east of the lower Tiber are of volcanic origin.

Much of the region has been shaped by the erosion of sedimentary rocks of various composition, and the result is a land of numerous small ranges of hills, divided by narrow valleys or by wider basins. In general, it is fertile country producing the wheat, fruit, olives and wine characteristic of the northern Mediterranean region. The hills are often crowned by villages or small walled towns, built during earlier centuries in situations where defence was easy, although the peasants might have to go some distance to their fields. Perugia and Assisi, with their old buildings and beautiful outlook over the surrounding country, are small hill towns which attract many visitors.

By the coasts are small lowlands, once malarial marshes, but now reclaimed. South of Rome are what were formerly the Pontine marshes (" P.M." on the map in Fig. 63) ; here and by the mouth of the Tiber fields have been laid out and new cities have been built in the work of reclamation.

But if some features of the region are quite new, others are very old, for the history both of Tuscany and the Roman country goes back many centuries. Florence, on the banks of the Arno, with its palaces now used as museums and picture galleries, is still a rich treasury of mediæval art and life, though around the old city tenement houses and factories of the machine-age have grown up, and raised its population to over a quarter of a million.

The chief port of the Tuscan area is Livorna (Leghorn) on the " safe " side of the mouth of the Arno. A few miles up the river is Pisa, once the port of Florence, but the silt of the river has destroyed its shipping trade, and, incidentally, proved an insecure foundation for the Campanile, which became the " leaning tower of Pisa."

Still older than the mediæval buildings of Tuscany are the memorials of ancient Rome, the " Eternal City." In the beginning it was a small settlement built on " the seven hills " (merely the eroded banks of the Tiber and small side-streams) at a point where a narrowing of the swampy valley made crossing relatively easy. On this site the city became the chief town of Latium, and, when the power of its rulers increased, its central and accessible position enabled it to become the capital of their

extended dominions. In this respect the history of Rome resembles that of other capitals of Europe, but with the unparalleled growth of the Roman Empire it virtually became the centre, both politically and geographically, of the civilized world.

When the Roman Empire fell, Rome declined, but it recovered to some extent with the growth of the power of the Popes, and became the spiritual capital of the world. Yet although its central position in the Mediterranean made it a good centre for widely extended realms, it has no large productive area in its vicinity and it is off the main lines of commerce; hence with the growth of trade near the end of the Middle Ages, Rome fell behind the other Italian cities in population, and its ancient buildings, streets and aqueducts continued to decay.

When, in 1870, the new Kingdom of Italy was formed, Rome became the political capital, while continuing to be the seat of the Papacy. The memorials of its ancient grandeur which remained throughout its chequered history, the many traditions of the past, and the reverence attaching to its spiritual eminence, —these have drawn to Rome visitors, and even residents, from all parts of the world.

Recently the growth of national feeling in Italy has led to restorations and improvements in the appearance of the city and to its development as the centre of the national life. Its population has increased, and now numbers considerably over a million people. Settlements have spread down the Tiber valley, where marshes have been reclaimed, but the chief port of the region is Civitavecchia, situated to the north, away from the sediment brought down by the river.

Southern Italy.—This is the part of Italy in which is experienced the full development of the “Mediterranean” characteristics of mild or even warm winters and pronounced summer drought, strikingly exemplified in the coastal regions on each side of the “toe” of the peninsula.

The Apulian Plateau.—On the Adriatic side, the low plateau of Apulia is exceptionally dry, and the limestone of which the region is formed is so permeable that there is no surface stream between the Ofanto and the far end of the “heel” of Italy, a distance of 150 miles. Nevertheless, there are fields of drought-resistant wheat, and the water-supply is carefully utilized for growing vines, olive trees and almond trees.

Round the coast there is a fairly considerable population, and

Bari and Taranto are fair-sized towns. Brindisi, which has a good natural harbour, is the port for traffic which has come as far as possible by the quick over-land route for mails and passengers to the East.

The Neapolitan Basin.—On the opposite side of the peninsula is the Neapolitan Basin ; it is separated from central Italy by uplands which extend from the main mass of the Apennines to the coast of the Tyrrhenian Sea. In the lowland around Naples the winters are appreciably warmer than at Rome, and warmer even than on the sheltered Riviera ; consequently the citrus fruits grow well. The Neapolitan Basin is an area of subsidence surrounded by macchia-covered limestone heights, and within the region are both alluvial and volcanic deposits ; here, as in several parts of southern Italy recent volcanism has important geographical consequences.

West of the town of Naples are the “ Phlegrean (burning) Fields,” a volcanic area in which small craters are to be seen and the “ solfatara ” still emit steam and hot, muddy water (see inset map in Fig. 63). East of the town the great cone of volcanic ash of Vesuvius rises to about 4,000 feet, capped by clouds of steam which occasionally rise to a glowing column ; at intervals there are outbursts of ash and streams of lava pour down the sides. Vesuvius stands within the broken crater of what was once a much greater volcano, Monte Somma, whose eruption in A.D. 79 destroyed part of its cone and overwhelmed the ancient cities of Pompeii and Herculaneum.

The lava of Vesuvius weathers to such a fertile soil that the peasants take the risk of cultivating the slopes for vineyards and orchards. Indeed, the Neapolitan basin in general is very productive ; besides grain, fruit and vegetables, tobacco and hemp are grown, and the region is densely populated.

The city of Naples is primarily the market and port of this productive area, and also for the wider region of southern Italy, of which at one time it was the political capital. There has been a recent growth of industries of various kinds, and there are many hotels to accommodate the visitors drawn especially by the interest of Vesuvius and the beauty of the Bay of Naples. The population of the city now numbers about one million.

The Southern Coasts.—From the Neapolitan Basin southward, and around the coasts of Calabria, the “ toe ” of Italy, are many small patches of lowland and stretches of terraced hill-sides on

which there is an intensive cultivation of vines and olives, figs and almonds, oranges and lemons.

Around these coasts and farther east on the peninsula of Apulia are the remains of Greek settlements, temples and statues, for here was "Magna Græcia," a region of Greek colonial expansion long before the rise of the power of Rome.

Facing the Strait of Messina is Reggio, a "ferry-port" for the narrow crossing to Sicily. The break between the peninsula and the island is due to faulting, and the earth's crust is here still so unstable that an earthquake in the early part of the present century reduced both Reggio and Messina almost to ruins.

The Southern Apennines.—Although at several points fertile valleys lead through these mountains, the uplands are less productive than in central Italy; clayey flysch districts are often very poor and limestone areas bare. In the far south the structure is different: the Sila mass (marked "S" in the map) is formed of granite and other crystalline rock, and has rounded heights reaching to over 6,000 feet, while Aspromonte ("A") is of gneissic rock, has sharper outlines and is of rather greater elevation. Although the highest parts are snow-covered in winter, the middle slopes bear deciduous trees and the lowest parts have extensive chestnut plantations. On the Sila there are great water reservoirs intended both for irrigation and for the supply of electricity for industrial development.

Sicily is essentially part of southern Italy. Its northern heights may be termed the Sicilian Apennines, for across the Strait of Messina appear mountains of gneiss like those of Calabria, while the rest of this area is mainly formed of massive limestone uplands.

By the east coast the great volcanic cone of Etna rises to a generally snow-clad summit 10,000 feet in height. Like Vesuvius, its slopes have small craters and lava-streams which menace the olive-yards, vineyards and dwellings of the very considerable population which has invaded it.

The rest of Sicily is, in the main, a much-dissected plateau of sedimentary rocks with a lower coastal zone, and these, too, have been well utilized. The interior of the island grows much corn, especially wheat, and by the coasts is an intensive cultivation of fruit, for which the climate is specially favourable.

But the sirocco wind, felt throughout the central and southern parts of the Mediterranean, blows here frequently and very

unpleasantly. It is a southerly wind accompanying the passage of depressions along the Mediterranean Sea, and it brings very hot and dust-laden air from the North African desert.

A minor resource of Sicily is sulphur, but this is now of less importance than formerly. Many tourists come to enjoy the warm and sunny climate, the beautiful scenery, especially in the neighbourhood of Etna, and the memorials of ancient Roman and Greek occupation. With its varied resources, and the export of much wine and citrus fruit, the island supports quite a dense population. On the east coast is the port of Catania, with a quarter of a million inhabitants, while on the north coast the capital, Palermo, has nearly half a million people.

The Lipari, or Æolian, Islands, which emerge steeply from the Tyrrhenian Sea, are of volcanic origin; Stromboli is almost constantly in eruption, and on the island Vulcano, from which the name volcano was derived, there is occasional activity.

The Maltese Islands are small limestone areas which rise from the shallows separating the eastern and western basins of the Mediterranean. They are most thoroughly cultivated, and are extraordinarily densely populated. They are a British possession, valuable as affording a port of call and a naval base on the Mediterranean route to India and the East.

Corsica and Sardinia.—In the main, these islands are composed of great masses of granite and other crystalline rocks which have been caught up among the folds of Alpine date. They are the highest parts of a belt of the earth's crust which has escaped the great subsidence of the Tyrrhenian Sea on the one side and of the western basin of the Mediterranean on the other. A rift-valley cutting off the south-western corner of Sardinia stands only just above sea-level and gives a lowland, the Campidano, which is exceptional in these high and cliff-bordered islands.

The very irregular relief and considerable altitude of much of the land would greatly limit cultivation, while parts of the coastal lowlands and the Campidano of Sardinia are naturally swampy and malarial. There have been recent improvements, but on the whole human agency seems to have brought about a deterioration of the natural conditions, for the widespread destruction of forest has led to the growth of almost valueless maquis over a great deal of the country.

Olive-yards and vineyards are cultivated at various parts of the coastal belts of both islands and in the Campidano lowland,

while on the uplands there are rather poor pastures for sheep and goats. Sardinia has a considerable amount of ores of lead, zinc and iron, and these are exported for smelting in Italy.

The capital of Sardinia, Cagliari, is a rather small town, and Ajaccio, the capital of Corsica, is still smaller, though it is the centre of a tourist industry attracted by the natural beauty of the island.

Sardinia is the least populous part of the Kingdom of Italy ; with about the same area as Sicily it supports only about a quarter as many inhabitants. Similarly, Corsica, which is one of the " départements " of France, ranks among the least densely populated areas of that country.

QUESTIONS

1. Write an account of agriculture in the North Italian Plain, tracing as far as you can the causes of the facts you adduce.

2. Make a reasoned study of the cities of North Italy, with special reference to their commercial and industrial development.

3. How far is it true that the Apennines are an unproductive barrier between the productive lowlands of Italy ?

4. What differences of climate can be observed in Peninsular Italy (apart from mountain regions) ? Show how these differences are related to the positions and productions of the various parts of the Peninsula.

5. Make a study of Rome and its evolution in relation to its site and its position both in Italy and also in the Mediterranean Lands as a whole.

6. Compare and contrast the islands of Sicily and Sardinia in as many respects as possible.

7. Examine the mineral resources of Italy with special reference to its industrial activities.

8. State and account for the broad features of the distribution of population in the mainland territory of Italy.

CHAPTER XV

THE IBERIAN PENINSULA

Introduction.—Although the Iberian Peninsula almost forms a bridge between Europe and Africa, for long periods it has remained apart from the main currents of human life, as it points south-westward, away from the older regions of civilization, towards the Atlantic Ocean and towards a corner of Africa which is itself separated by desert from the wider world of men.

Yet it was from north-western Africa that, about A.D. 700, the Moors overran the Peninsula as far as the mountains of the north. For a period of about 400 or 500 years they dominated much of the country, and their influence is still to be seen in many ways, especially in the south, where they maintained themselves longest. Here are the "huertas," the "gardens," in which the most intensive forms of cultivation are carried on by methods of irrigation brought from Africa; here are mosques and other buildings of "Oriental" aspect, while the costumes, words, names and even the physical appearance of some of the people bear further witness to the Moorish occupation.

The Pyrenees almost cut off the Peninsula from the rest of Europe, while other highlands hinder movement across it and to a large degree isolate its most habitable parts from one another. We will therefore first examine its relief and structure from this point of view.

Relief and Structure.—There are three main elements in the structure of the Iberian Peninsula (refer back to Fig. 58). First, there is the Hercynian massif, the broad upland known as the Meseta, which forms the greater part of the west and centre of the Peninsula. An ancient peneplain was raised to form a ridged and dislocated plateau at the time of the Alpine disturbances. As a whole the Meseta was tilted with a slope from its high eastern margin down towards the Atlantic, and in this direction flow the Rivers Douro, Tagus and Guadiana. In the north-west, however, the Galician portion of the massif drops by fault-edged coasts to the ocean.

Also, dislocations within the Meseta area have uplifted a series

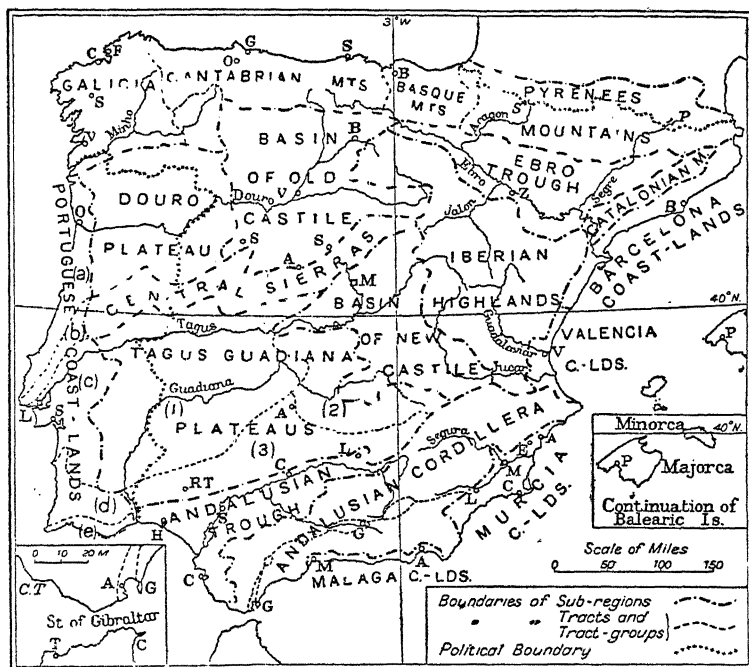


FIG. 64.—REGIONS OF THE IBERIAN PENINSULA.

of resistant blocks in the region of the Central Sierras, namely the Sierra de Gata, the Sierra de Gredos and the Sierra de Guadarrama.

On each side of this central highland region warpings of the Meseta have formed two shallow upland basins, those of Old Castile and New Castile, in which have accumulated deposits mainly of Tertiary and later age. In the high basin of Old Castile, the waters from the surrounding mountains collect to form the Douro, which flows slowly over the fairly level surface of the basin as far as Zamora; below this town the river runs more swiftly and has cut through the upland area marked on the regional map as the Douro Plateau, first by a gorge in the south-westerly part of its course and then by a wider valley where it flows more directly westward to the Portuguese Coast-lands.

In the high basin of New Castile, the Tagus and the Guadiana similarly run slowly and have relatively shallow valleys in the basin area, and have cut more marked valleys where they cross

the older rocks in the region which may be termed the Tagus-Guadiana Plateaus.

The second main element in the structure of the Peninsula consists of the highlands due to the foldings and thrusts of the Alpine type. In the north are the Pyrenees, continued westward in the Cantabrian Mountains behind the north coast about as far as Oviedo, where the folded mountains are welded, as it were, into the north-western corner of the Meseta. In the south are the ranges forming the Andalusian, or Betic, Cordillera, which appear to swing round from north-west Africa and the Strait of Gibraltar north-eastward, breaking down at Cape de la Nao under the Mediterranean Sea, but reappearing in the Balearic Isles.

To these fold mountains of definitely Alpine type may be added two other upland areas which were raised as a result of the same series of disturbances: the relatively narrow Catalanian Mountains which shut off the Ebro Trough from the Mediterranean, and the broad mass of the Iberian Highlands where Secondary limestones previously laid down upon the Meseta were uplifted to form its high eastern edge.

The third element in the structure is shown in the lower lands, generally areas of dislocation and subsidence, which border the upraised tablelands and mountains, and are floored by sedimentary deposits of Secondary, Tertiary or later age. Of this type is the Ebro Trough, whose steep south-western wall is the fault-bounded edge of the Meseta, but which rises more gradually on its northern margin to the Pyrenees. From all sides it collects the waters to the River Ebro, which meanders through the lowlands of the Trough and then cuts a narrow and tortuous course through the Catalanian Mountains to the sea.

Of rather similar formation is the Andalusian Trough, above which rises the rampart of the Sierra Morena, while the south-eastern side rises by hills and plateaus to the Andalusian Cordillera; unlike the Ebro Trough, however, it is open to the ocean, and the Guadalquivir flows to the Atlantic through a broad, delta-like lowland.

The eastern highlands of Spain break down towards the Mediterranean in a series of great curves, and within these curves, between the mountains and the sea, are a number of lowlands important as areas of production and population.

The Portuguese Coast-lands are of composite formation. In

the north the ancient rocks of the Meseta sink gently to the coast; south of the Douro is an area of subsidence floored by relatively recent deposits; south of this area a line of heights extends westwards from the Central Sierras to the hills of Cintra behind Lisbon—this line may be conveniently termed the Cintra Hills; next follows another lowland of recent deposits, through which the Tagus winds slowly to the Atlantic; then the platform of the Meseta reaches to the Atlantic and its south-western corner projects in Cape St. Vincent; finally a low coastal strip forms the southernmost part of Portugal.

The consequence of the structure of the Peninsula is that the upland of the Meseta and the fold mountains together bar easy communication across the Peninsula in any direction; the lower and more populous areas are cut off from one another to an unusual degree. The Peninsula has therefore been described as a region of isolations.

Climates.—The position and relief of the Iberian Peninsula together give it a strongly contrasted set of climatic conditions.

In the first place, its northern part is in the climate belt in which cyclonic conditions are common throughout the year. The north-west is so exposed to the Atlantic on two sides that it has the oceanic temperate type of climate (refer back to Fig. 15). The figures on p. 26 show that Santiago, in Galicia, in spite of being over 800 feet above the sea, has rather warmer conditions, both in summer and winter, than Brest, while it has a heavier rainfall than any other place mentioned in the table except Bergen. Conditions are not greatly different along the well-watered Cantabrian region, and in this northern belt a lack of rainfall becomes noticeable only on the southern side of the Pyrenees.

The "Mediterranean" climatic region begins to the south of the northern belt of the Peninsula, but the differences of relief allow the typical Mediterranean conditions to be experienced only over parts of the area. The high Central Sierras have a relatively heavy rainfall and relatively low temperatures, and thus lack both the drought of summer and also the mildness of the winter; their climate is, indeed, similar to that of north-western Europe. The Iberian Highlands region and the high Basin of Old Castile have summer drought, but over most of their area the winters are too cold for the growth of the olive (see Fig. 18), and on this account can scarcely be regarded as

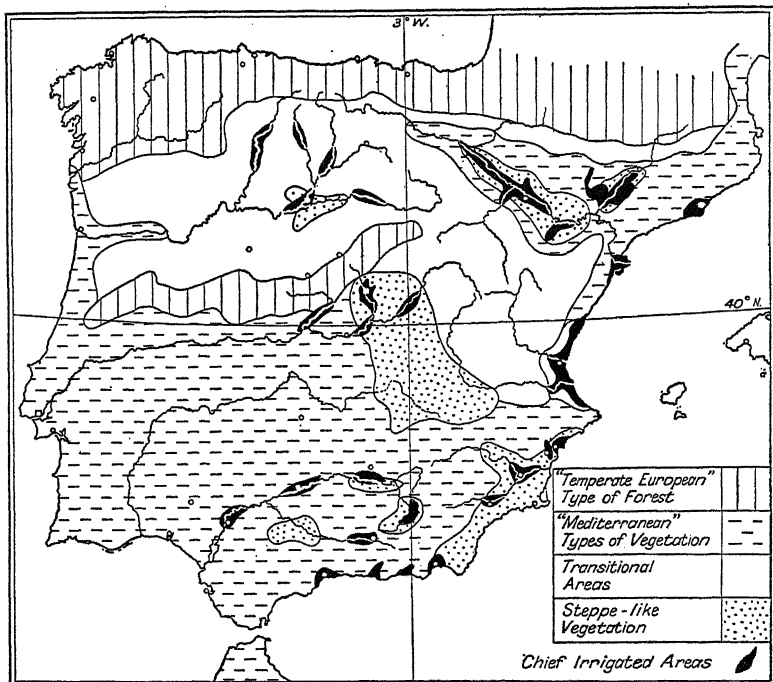


FIG. 65.—NATURAL VEGETATION-TYPES AND IRRIGATED AREAS OF THE IBERIAN PENINSULA.

having a truly Mediterranean climate. The Douro Plateau region is also transitional in regard to climate, for only its more sheltered valleys, not the exposed uplands, are mild and dry enough for the typical Mediterranean products.

Of the remaining regions of the Peninsula, the greater part may be classed as having the Mediterranean climate, and olives are grown in all areas except where the altitudes are too great. But on the eastern side of the Peninsula, barred by highlands from the moisture-bearing winds of the Atlantic, the summer drought is so long, and even at other seasons the rain is so little, that the climate almost approaches that of the semi-deserts.

In the driest areas irrigation is needed to obtain the common Mediterranean products; the natural vegetation is very scanty and the growths are like those of the steppe-lands, esparto grasses being at one time the characteristic plants of the more southerly of these semi-arid regions. Because of the natural vegetation, the drier parts of the eastern lowlands of Spain are

sometimes described as having the steppe type of climate, but they do not have the cold winters of the true steppes.

An important feature of the rainfall is its variability, especially in the interior. In some years the rain is fairly abundant and the growth of vegetation is relatively good ; in others, there is drought, and pastures dry up while only irrigation can keep crops from complete failure.

One should note also that on the broad, high areas of the interior the normal range of temperature between summer and winter is greater than that of Mediterranean climate regions elsewhere. (See the figures for Madrid on p. 26.) The daily range is also great, especially in summer, and the mean annual maximum at Madrid is 104° F., a figure higher than that given for any other station in the table, although Madrid stands at a height of more than 2,000 feet above the sea. The winter nights are frequently bitterly cold, and the figures show that at Madrid, although the average January temperature is 40° F., the mean annual minimum sinks to 14° below freezing-point.

As a result of this contrast between summer and winter, something like a small monsoonal condition tends to occur over the Peninsula ; the summer becomes a season of considerable heat, with relatively low air-pressures and in-blowing winds, while the winter is a season of cold, with relatively high air-pressures and out-blowing winds. Yet it must not be supposed that these systems develop to a degree which brings about the summer rain and winter drought typical of a monsoon climate ; the general conditions of the Atlantic wind systems and the paths of depressions give the normal conditions of winter rain and summer drought to the greater part of the Peninsula.

Constituent Regions.—The marked differences in relief and in climate necessitate a division of the Iberian Peninsula into a relatively large number of sub-regions of contrasting characteristics.

The Northern Mountain Regions.—*Galicia* is mild and well watered, and has forests of "mixed" character. Apple trees are common, and from them cider is obtained as a common drink of the people ; the vine, mulberry and fig trees are grown, and maize is the chief cereal. There is much meadow-land and cattle-rearing is an important element in the farming. The "drowning" of the coast has given good harbours, and encouraged maritime pursuits ; in Galicia, La Coruña (Corunna)

and Vigo are fishing ports, and the latter is a port of call for liners, while the deep and almost land-locked harbour of Ferrol is a Spanish naval station.

The Minho is the largest river of Galicia, and its tributary the Sil comes from a more inland area ; consequently this tract of the Upper Sil is drier, less productive and has fewer inhabitants than Galicia, which ranks among the more populous regions of Spain.

The Cantabrian Cordillera.—Here the climate and productions are broadly similar to those of Galicia, but the granitic block gives place eastward to sedimentary rocks and near Oviedo a Carboniferous basin yields the most important supply of coal in the Peninsula. With coal and other minerals found in the same district Oviedo has become an industrial town, with Gijon as its port, and this province of Asturias is fairly well populated.

Farther east, limestones folded in the "alpine" disturbances rise to nearly 9,000 feet and form one of the highest parts of Spain, making an effective barrier between the north coast and the inland areas of Leon and Castile. There are, however, passes behind Santander which enable that town to serve as a northern outlet for the interior.

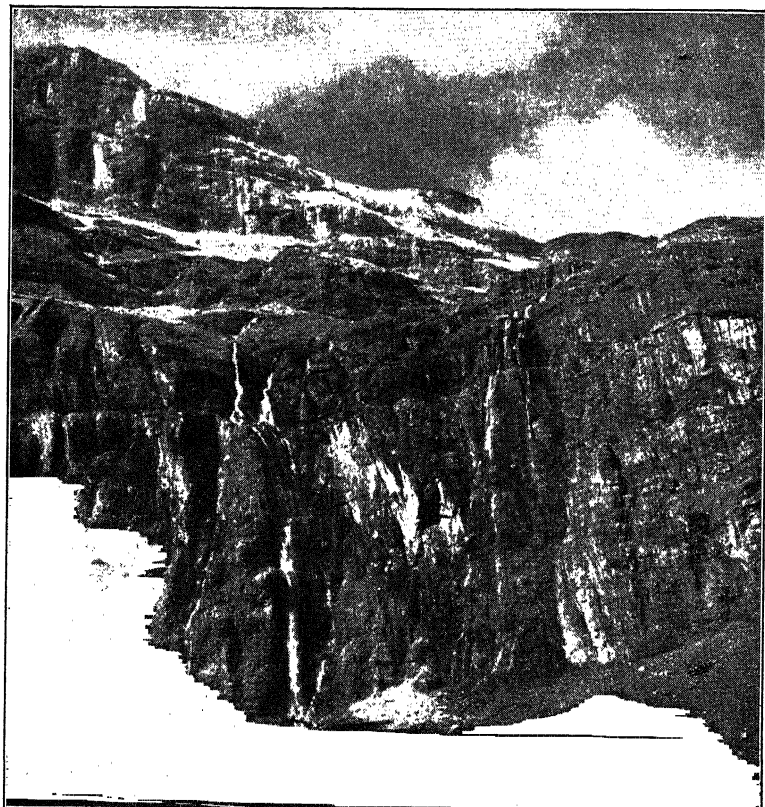
The Basque Mountain Region links the Cantabrian and the Pyrenean mountains, but its lower elevation gives relatively easy routes from France through Old Castile to central Spain.

For a mountainous region, the Basque country is productive, obtaining the same commodities as the more westerly regions of the northern belt, and it has a number of towns of moderate size. The largest is Bilbao, which owes its importance mainly to the occurrence of iron ore ; this is found near the deep inlet which forms a good harbour from which part of the ore is exported, while the rest is smelted at Bilbao with imported coal.

This coastal region and that of Catalonia are the two most densely populated and most highly developed parts of Spain, and in each case the character of the people has been an important factor in their advance. The Basque people are distinguished by qualities of industry and energy as well as by their retention of an ancient language, old customs and a tenaciously held tradition of a nationality different from that of the other inhabitants of Spain. It should be noted that the region here marked out on a geographical basis does not quite correspond with that occupied by the Basque-speaking people, for it extends

farther to the south than their country, while many Basques live in the Pyreneean region, even across the French frontier.

The Pyreneean Region.—These mountains are not one “range”; they are composed of a broad belt of highlands, with a longi-



[French Railways—National Tourist Office.]

FIG. 66.—VIEW OF THE CIRQUE OF GAVARNIE.

Note.—The Cirque of Gavarnie is on the French side of the water-parting of the Pyrenees, which here forms the political boundary. It is one of the most striking witnesses of past glaciation: a colossal amphitheatre two miles across, whose vertical sides rise in terraces to a height of about 5,000 feet above the floor of the rock basin. The summit shown in the view is about 10,000 feet above sea-level, and a mile or two behind this is Mt. Perdu, the culminating peak of the Pyrenees.

tudinal axis of crystalline rocks and with folded and faulted sedimentary strata on both flanks.

The crystalline zone is widest and highest away from the Atlantic and the Mediterranean; in this central area a number of peaks reach over 9,000 feet, the lowest passes are well over 6,000 feet and crossing is very difficult. The difficulty is

increased by the cirque formations, due to glaciation in the Ice Age, which give abrupt ends to the valleys. One of the most striking features of the scenery is the huge amphitheatre of the "Cirque of Gavarnie," which is overlooked on the Spanish side by Mt. Perdu, over 10,000 feet in height.

At each end of the region the contorted and broken sedimentary rocks, often limestones, occupy more of the area, and these are most widely developed on the southern side. Here they have been eroded into irregular tilted plateaus, whose steep scarps are so notched that they are called "Sierras," i.e. "saws."

Where the high crystalline region gives place to the lower areas of the two ends, railway routes have been constructed which tunnel below the passes connecting the Spanish and French valleys. The western line runs northward from Zaragoza by the Somport or Canfranc tunnel (marked "S" on the regional map), and the eastern one northward from Barcelona by the Puymorens tunnel ("P" on the map); the main railway traffic from the Iberian Peninsula, however, still goes by the routes skirting the seaward ends of the region.

On the Spanish side precipitation is generally scanty, and the chief resources are the rather poor pastures; here the aspect of the country is often barren and settlements are rare.

The Portuguese Coast-lands.—In the coastal region south of the Minho watershed, the climate is clearly "Mediterranean," as is shown by the temperature and rainfall figures for Oporto on p. 26.

In the *North Portugal Lowland*, marked "a" on the regional map, the warmth and the ample precipitation combine with fertile soils to allow a wide range of products; these include both those, such as maize, which are characteristic of the warmer parts of Temperate Europe as well as the wheat and fruits of the Mediterranean Lands. Here is Oporto with an export trade of "port" wine, made from the grapes grown along the valley of the Douro where it cuts through the adjoining plateau. Taken as a whole, this northern part of the Portuguese Coast-lands is one of the most productive areas of the Iberian Peninsula.

The *Cintra Hills* ("b" on the map) are abundantly watered, and have woods of chestnut, pine and oak as well as groves of orange and lemon trees.

South of the Cintra Hills, the *Tagus Lowland* (marked "c") tends to suffer from a lack of water. Much of the area is occupied

by poor pastures or the maquis type of vegetation, though in the neighbourhood of the River Tagus grain and olives are produced to a considerable extent. Centred upon Setubal are two other resources : fishing, especially of sardines, and the extraction of salt from coastal lagoons.

On the shore of the Tagus estuary stands Lisbon, the capital of Portugal, in a convenient position mid-way along the coast of the country ; the city has a population of about two-thirds of a million people. Lisbon has a beautiful situation overlooking the broad, lagoon-like estuary and extending by terraces up the slopes of the Cintra Hills. Yet it is in a part of the Peninsula where crustal instability still persists, and less than two centuries ago an earthquake destroyed the western part of the city and cost scores of thousands of lives.

The *South Portugal Uplands* (marked "d"), where the Meseta extends to the Atlantic, are noteworthy as having the chief mineral resources of Portugal ; near the Spanish frontier there is a considerable development of copper-mining.

The *Algarve Lowland* (marked "e") has a fertile soil and a south-facing aspect, and obtains water from the adjoining uplands. With a closely settled and hard-working population deriving methods of cultivation from the Moorish occupation, it is an area of great productivity, and in addition there are a number of fishing settlements along the coast.

The Douro Plateau.—Into this upland the rivers have cut deep valleys. The south-westerly course of the Douro is rapid, and encumbered by reefs, and the valley walls are sometimes cañon-like. Where the river resumes its westward course the valley widens, and on the terraced slopes are olive-yards and vineyards; the difference of vegetation types is shown in Fig. 65.

On the upland parts are heaths and pastures, while wheat and the Mediterranean fruits are grown in the more favourable valley areas. There are no large settlements, and as a whole the region is not well populated.

The Basin of Old Castile.—The larger part of this region lies at an altitude of about 2,500 feet, but it is enclosed by still higher areas ; consequently it is relatively little influenced by winds from the sea and its climate is marked both by a cold winter (Valladolid has a mean January temperature lower than that of London) and also by a lack of water, particularly in summer (Valladolid has a mean annual rainfall of about

12 inches, of which less than 2 inches fall in the summer season).

Moreover, the daily range of temperature is great, and often the ground is subject to rapid alternations of frost and thaw, while in summer it may be cracked by drought and heat. In addition, the soils which have developed upon the Tertiary and other deposits have, over considerable areas, a high salt content.

Under these conditions neither the forests of Temperate Europe nor the fruit trees of the Mediterranean region can have a wide distribution; the natural vegetation consists of the poorer growths of the Mediterranean type and in the driest areas approximates to that of the steppe-lands.

There are, of course, differences within this sub-region. For example, the higher northern and eastern margins are relatively bare, and often of stony appearance; around Burgos and Valladolid wheat is grown and large flocks of sheep are kept; south of Valladolid pine plantations are the chief resource; in the south-west of the region the less severe climate allows the cultivation of cereals, sugar-beet and even vines.

Valladolid is the centre of the railways and roads which traverse the region, and the other towns of moderate size are on the margins where these routes cross the encircling highlands.

The Central Sierras.—These high ranges, which rise to about 8,000 feet, have a fairly heavy precipitation, and on their highest parts the winter snows may last even till June. The deciduous forests of earlier times have now been largely destroyed and migratory pasturage is the chief resource, apart from farming in the valleys.

Although the steep slopes of the Sierras often present the appearance of colossal mountain-walls, there are gaps between them which offer routes connecting the more populated regions on either side.

The Tagus-Guadiana Plateaus have a somewhat similar structure and relief to those of the Douro Plateau, though the main river-valleys are in general broader and in parts open out into almost lowland areas. In consequence there is here a greater proportion of farmed land, and also the warmer climate allows the growth of the Mediterranean group of productions.

In this extensive sub-region three tract-groups may be distinguished. The western area, marked (1) on the map, is the best watered and therefore the most productive. The eastern

area (2) is more arid and more extreme in climate, and it can support only a rather scanty population ; on the north-east margin is Toledo. The southern area (3), which includes the irregular and in parts even rugged country of the Sierra Morena, is distinguished from the other plateaus by its mineral wealth ; mercury is obtained at Almaden ; copper is mined in the Rio Tinto district, and is in part smelted in the neighbourhood, in part exported from Huelva ; farther east some lead, zinc and coal are found ; on the south-east margin north of Linares lead is mined and smelted.

The New Castile Basin.—The temperatures here are normally higher than in Old Castile, and aridity is a common characteristic of the climate. Among the unpleasant weather conditions are the dust-storms of summer and the snow blizzards of winter. In the south the streams have an uncertain flow ; the upper Guadiana in normal conditions loses its water in the gravel of its bed and has an underground course for several miles, and the Manzanares, the small tributary of the Tagus on which Madrid stands, is completely dry for half the year.

Much of the region has a rather desolate aspect, like that of a poor steppe-land. There are, however, some fairly wide areas in which wheat and barley can be grown, and oasis-like valleys in which there are olive plantations and vineyards. Also, especially near Madrid, there are irrigated huertas, which stand out in strong contrast to the surrounding country.

The one large settlement is Madrid, which rose to importance only when, in the sixteenth century, it was made the capital of Spain ; for this purpose it was well situated, in the centre of the country and at the meeting-point of the chief roads. Now the railways converge upon it and it has become the centre of inland commerce with about one and a half million inhabitants.

The Iberian Highlands.—This region comprises a group of plateaus relatively little raised above the centre of the Peninsula, but descending steeply by step-faults to the Ebro Trough. The rivers have cut deep valleys ; some of these, like the Jalon tributary of the Ebro, give routes into the interior, and some open out into wide areas or even productive basins. Other rivers, however, have cañon-like valleys of little use even for roads ; this is particularly the case with the Jucar, Guadalaviar and other rivers in the southern part, and consequently Valencia and the neighbouring Mediterranean Coast-lands are

almost completely cut off from the Basin of New Castile and Madrid.

With a severe climate, the Iberian Highlands are in general unproductive and poorly inhabited.

The Ebro Trough.—This region is so shut off from maritime influence that it has a very scanty rainfall, Zaragoza receiving about 12 inches a year, and the soils often contain salt or gypsum and are generally infertile.

The margins of the region have the maquis type of vegetation, while the central portions are largely treeless steppes and in parts are even salt-wastes. Only where the waters of the Ebro and its tributaries are led out by canals is the generally desolate appearance of the country relieved by continuous ribbons of green; in these irrigated valleys of the Ebro, Jalon and Segre are produced corn, beetroot, vegetables, olives and vines.

The upper part of the Trough, above Zaragoza, is better watered and the only part where the population is not very scanty, apart from the irrigated areas. Zaragoza is the one large city, situated in the centre of the routes which cross the region.

The Ebro is of little value in linking the region with the Mediterranean Sea, for its winding course is not navigable for large vessels and the delta is too shallow for sea-going ships.

The Catalanian Mountains are better watered, and the area includes a number of river valleys and interior basins in which the typical Mediterranean productions are obtained to a considerable extent; also there are some coal, salt and mineral springs. Together with these natural advantages must be considered the character of the people; the Catalonians have shown themselves to be enterprising and active in mind and body. Hence the resources have been well utilized, industrial developments have been fostered, and even within the mountain region are areas of relatively dense settlement.

The Andalusian Trough.—Open to the Atlantic, this region has a greater rainfall than the Ebro Trough, but because of its more southerly latitude it has a marked period of drought in summer and higher temperatures throughout the year. Parts of the region have only the steppe type of vegetation, but others bear cereal crops. Below Cordoba the valley of the Guadalquivir is more fertile; cereals, beet and vegetables are largely produced, and the Mediterranean fruits can here ripen to perfection. The natural water-supply is supplemented by irrigation,

and for this the Guadalquivir is particularly favourable, for the snow of the high Sierra Nevada and other ranges feeds its head-streams long after many of the rivers of southern Spain are reduced to a mere trickle or even run dry.

Below Seville is a swampy area, and along the sea-board of the region are marshes and lagoons from which salt is obtained.

In Cordoba and Seville are beautiful buildings, examples of the architecture of the time when the cities flourished during the Moorish occupation. Seville is still the most important trading centre in the south of Spain ; with varied manufactures, especially of cotton and other textile goods, it has a population approaching half a million inhabitants. Cadiz has a good situation as a port-of-call for Mediterranean traffic, and is a centre for the production and export of "sherry," the wine named from the neighbouring town of Jerez.

The Andalusian Cordillera.—This region includes two zones : (i) a northern area of moderate height, formed mainly of limestones and flysch ; (ii) a southern area formed largely of schists and other crystalline rocks, which rises to the Sierra Nevada, the highest part of the Iberian Peninsula. Between the two zones is a narrow interior belt comprising a series of valleys linking broader basins.

The higher crystalline zone reaches over 11,000 ft. in the Sierra Nevada, and cirques and mountain-lakes show the effect of past glaciation. It is well watered, but the woodlands which once covered the mountains are now almost gone. The snow on the heights lasts till late summer and the water is used both in the valleys of this region and on the neighbouring coast-lands. The valleys on the southern side are very productive : olives are grown to an altitude of over 3,000 feet ; chestnut, mulberry and walnut trees to over 5,000 feet ; rye and potatoes even above 8,000 feet. The sedimentary zone of the Andalusian Cordillera is in general poor country of maquis, with several steppe-like tracts and relatively small productive areas ; some of the limestone uplands have typical karst characteristics.

The narrow interior belt of valleys and basins is important as giving opportunities for communications ; also cultivation is favoured by water from the southern heights, and some of the basins have considerable populations. The vega¹ of Granada is still prosperous, though the town has lost the importance which

¹ "Vega" is the Arabic word for "huerta."

it had when it was the capital, and the last bulwark, of the Moors in Spain ; the beautiful palace of the Alhambra, which overlooks the city, is a famous memorial of Moorish architecture.

Where the interior belt is cut by the Strait of Gibraltar, it descends into the bay named Algeciras, from the town on the western shore. The eastern side of the bay is formed by the steep-rising limestone mass of the Rock of Gibraltar, and here have been constructed the British fortress and dockyard to protect British interests in the Mediterranean route to India and the East.

The Mediterranean Coast-lands.—This term is used to denote the lands bordering the Mediterranean Sea, which are sufficiently low to have the typical Mediterranean products ; they comprise four tracts, which may be named after the chief towns : Barcelona, Valencia, Murcia and Malaga.

The Barcelona or Catalanian Coast-land has an irregular relief, and in parts is cliff-bordered. The greater part of the land is productive, and irrigation supplements the rainfall, especially for growing vegetables for the use of Barcelona and other towns of the region, as well as for export ; much of the Ebro delta is devoted to rice cultivation.

The characteristic development of the Catalanian Coast-land is, however, industrial. At numerous smaller centres as well as at Barcelona there are manufactures of the various textiles and of machinery, glass and chemicals ; the work is carried on with the aid of imported coal, and with electric power derived largely from the Pyrenees and Catalanian Mountains. Besides being the largest industrial city, Barcelona is the chief port of Spain, and is also the cultural centre of the Catalanian people ; consequently it is the second largest city in the Peninsula, having a population of over a million and a quarter inhabitants.

The Valencia Lowland.—This region differs from that north of about latitude 40° in two respects. In the first place it is an almost unbroken lowland, floored by relatively recent deposits or river alluvium. In the second place it has higher temperatures and a very marked summer drought ; hence much of the region is naturally of the steppe-land type. Now, however, there are only small “ islands ” of esparto grass, and very large areas have been converted into extraordinary productivity by irrigation.

The Guadalaviar, Jucar and other streams bring water from

the highlands, which is led out over the almost level country by a multitude of channels, and wheat, maize and barley, flax and hemp, rice, vegetables of all kinds, vines and olives, mulberries and pomegranates, almonds and oranges are obtained by intensive cultivation; in the case of the grains and vegetables a careful rotation of crops allows more than one harvest in the year.

With an abundance of water, no great engineering schemes are

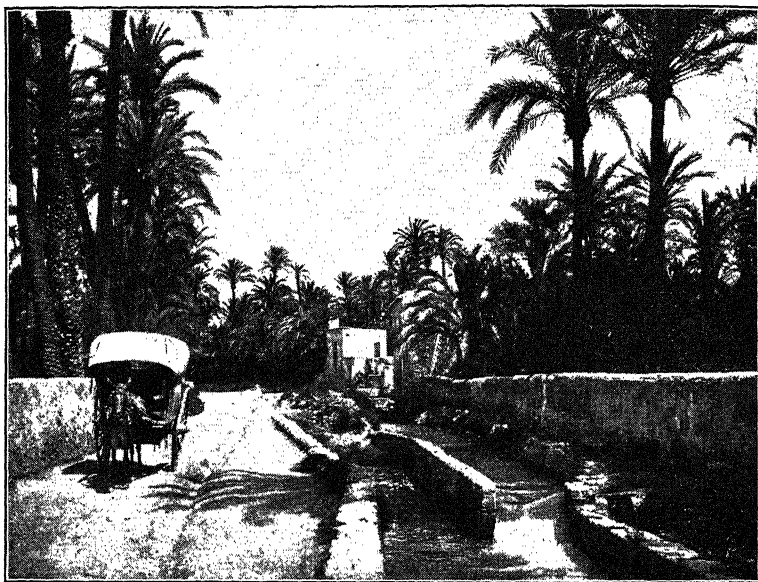


FIG. 67.—VIEW IN ELCHE.

[E.N.A.]

Note.—This is almost the only region in Europe in which date-palms flourish and ripen their fruit. In Elche there are about 80,000 trees; these are well adapted to the occasional droughts by their deep roots, which draw water stored in the subsoil for a considerable period. The view shows the road from Elche to Alicante, with an irrigation-channel beside it. Observe the short shadow cast by the covered mule-cart—an indication of the altitude of the sun, and hence of the relatively low latitude.

required; the method of irrigation is simple, although elaborate. The owners of the land have a right to a share in the water, and only rarely does drought necessitate a limitation of the supply.

A dense population finds work and subsistence in the region. Denia and Gandia have their names associated with the fruit sent abroad, but in Valencia is concentrated much of the commercial life of the region, and, with industries also, it has a population of about half a million persons.

The Murcia Coast-lands.—Here the temperatures are still higher, while the rainfall is less and very variable; occasional

floods may destroy the irrigation works, and droughts may cause the supply of water to be deficient or even to fail. Hence irrigation is mainly limited to the neighbourhood of Murcia, where the Segura brings water from a wide catchment-basin, Lorca, on a tributary of this river, Alicante and Elche.

Also, the organization of the system is different. Great barrages and costly canal construction are necessary, and the proprietors of these irrigation works sell the water to the owners or tenants of the land. When supplies are deficient, the price is raised and the cultivators may be seriously affected, both by the lack of water and by the cost of the small amount which they can procure.

The agricultural production of this region is similar to that of the Valencia area. In addition, minerals are obtained, especially lead and iron, from near Cartagena. This port sends out the ores and the fruit of the region, and having a good natural harbour is the chief Mediterranean naval station of Spain.

The Malaga Coast-lands are formed in part by relatively small areas of lowland, such as those of Almeria and Malaga, where there are vegas, and in part by the terraced south-facing slopes of the Andalusian Cordillera. In this region there is a better rainfall than on the eastern coasts, and a more ample water-supply from the highlands. The summer heat is sufficient even to allow the growth of bamboos, sugar-cane and banana trees. From the ports of Malaga and Almeria, wine and grapes are largely exported, and also iron ore from the adjoining uplands.

The Balearic Islands, of which the largest are Majorca and Minorca, continue the direction and the structure of the Andalusian Cordillera, and are in part mountainous, in part lowland. The uplands have large areas with the maquis type of vegetation, though their borders have terraces for olives, vines and carob trees; on the lowlands, irrigation is utilized for cultivation and almonds are produced in great quantities for export. Palma is a town of moderate size, and as a whole these islands are more productive and more densely populated than Corsica and Sardinia.

QUESTIONS

1. Describe the structure of the Iberian Peninsula, and indicate how it has influenced other factors of the physical geography.
2. Expand, and if necessary modify, the statement that the Iberian Peninsula is a region of isolations.

3. Consider what parts of the Iberian Peninsula have climatic conditions which are "typically Mediterranean" and "modified Mediterranean" respectively.

4. Select three areas with markedly contrasted types of natural vegetation in Spain. State the position of the areas, and describe and account for the characteristics of the vegetation-types.

5. Compare and contrast the position and physical characteristics of the Balkan and Iberian Peninsulas.

6. Write an essay on "Irrigation in Spain."

7. Make a systematic and reasoned study of the main facts of the geography of Portugal.

8. Show in what ways the Moorish invasion has influenced the present-day human geography of the Iberian Peninsula.

9. Examine the dictum: The outstanding fact in the human geography of Spain is the opposition between the central and the marginal peoples.

10. Contrast the average density of population in the Iberian and Italian Peninsulas; trace the causes of the difference.

CHAPTER XVI

THE SCANDINAVIAN PENINSULA

IN Part I, the general characteristics of the major geographical regions represented in this Peninsula were described (refer back to Fig. 19); here more detail, particularly as to their economic development, will be given.

The Atlantic Margins of Scandinavia form part of Temperate Europe. They are composite regions in that they consist partly of lowlands and partly of uplands, but they have the following common characteristics: their climate and productions are greatly affected by oceanic influences; they have scattered communities of people throughout their extent; these communities look mainly outward towards the Atlantic, and not inland towards the rest of Scandinavia.

The extent of the region is great, covering over 13° of latitude; hence climatic conditions vary markedly and two sub-regions must be distinguished (see Fig. 68).

The South-Western Coast-lands begin with the southernmost point of Norway and include the region around the Trondheim Fiord. In the extreme south the coastal plain is relatively wide and continuous, and here agriculture, mainly the growing of oats and barley, is a relatively important occupation.

From Stavanger northward, the lowland appears only as small islands and patches of coastal plain (refer back to Fig. 2), whose hummocky morainic surface is grass-grown and mainly used for pasture. In addition there are only small habitable areas at the sides of the fiords, and at their heads where river valleys lead upward to the highlands; yet the considerable extent of the fiords (note the length of the Sogne Fiord as shown in Fig. 2) and their many branches allow scattered settlements to reach far into the interior.

The steep slopes behind the coast and by the waters of the fiords have occasionally terraces used for summer pasture or for growing hay fed to the cattle in their winter stalls. On the slopes, too, are woods which provide timber used for house-building and for many other purposes for which other materials

are employed in more southerly latitudes. There are innumerable waterfalls on the mountain sides, and many of these are utilized for obtaining electricity for lighting and for power used in

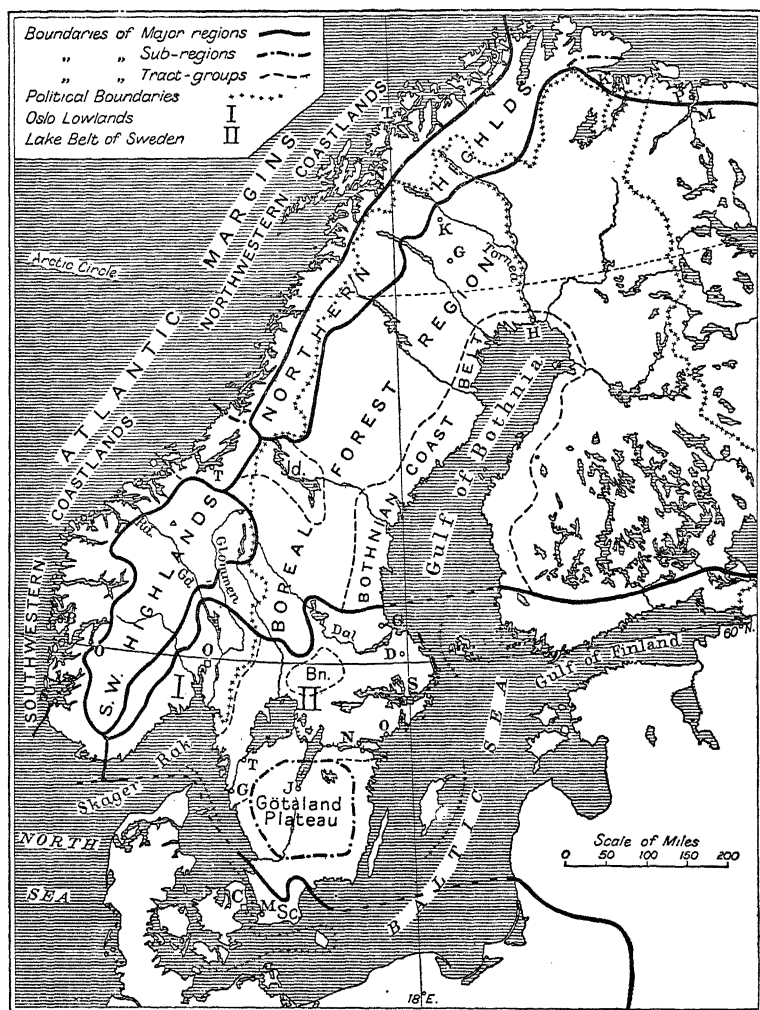


FIG. 68.—REGIONS OF THE SCANDINAVIAN PENINSULA.

chemical, metallurgical, timber, and food-processing works established by the fiords where easy transport allows.

Fishing is one of the chief resources of the people. In the

small settlements the family combine this work with the care of their animals and land ; the towns are all centres of fishing fleets, and in them are carried on the sale of fresh fish and the preparation, by drying, salting or canning, of fish for export. In the extreme south, as far north as Stavanger, mackerel are largely caught ; herring become more important in the area which centres upon Bergen. This is the largest town of the Atlantic regions ; besides being a centre of local trade, it is the northernmost terminal of trans-Atlantic liner communication and is connected by railway across the highland with Oslo.

Trondheim is situated in a wide lowland area ; its fiord, around which are quite extensive areas suitable for farming, is longitudinal to the coast. Structurally, the region is one of relative depression, and behind the coastal lowland is a break in the highlands which may be called the " Trondheim saddle " ; this gives fairly easy access to the eastern part of the Peninsula, and across it a railway joins Trondheim to Sweden. Two other lines go southward from Trondheim to the Oslo region, taking advantage of the Glommen and Gudbrandsdal valleys through the South-western Highlands.

Because of its situation in an unusually productive and accessible environment, Trondheim was in past centuries the centre of Norwegian settlement on the Atlantic coast and the capital of the old kingdom of Norway. Now, however, Trondheim is of far less importance than the modern capital, Oslo, and is even surpassed by the trading centre of Bergen.

The fiords count for very much in the life of the Atlantic Coast-lands ; traffic between the settlements is largely carried on by small steamers, for communication across the highlands is limited to certain routes and almost entirely stopped during the long winter. Also, the fiord scenery, with its beauty and grandeur, brings many visitors from overseas, and thus adds to the contacts of the Atlantic Margins with western lands.

The North-western Coast-lands are less favoured by climate, for the summers are colder and shorter, while the winters are longer and have very little daylight. Agriculture is very restricted, and barley is practically the only crop that can be grown. As the latitude increases, the supply of timber and the area of pasture-land become less ; fishing is the chief resource of the scanty and scattered population, while the trading towns are fewer in number and smaller in size.

A marked contrast with the south is shown by the lack of small, low islands, while the Lofoten Islands represent a partially drowned mountain region, showing the features of Alpine

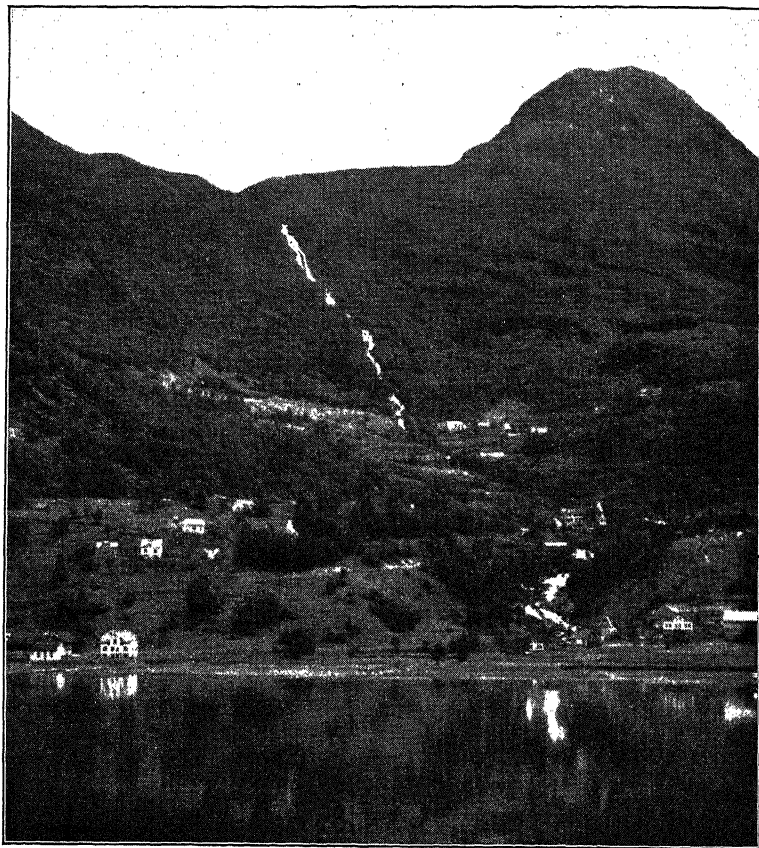


FIG. 69.—VIEW ON THE STOR FIORD.

[Norwegian State Railways]

Note.—This is the head of one of the smaller Norwegian fiords—about Lat. 62° N. A stream falls from a hanging valley into the main valley occupied by the fiord, in which it forms a small delta, partially seen on the right. Above the delta is a terrace used as a site for houses, while hotels have been recently built near the water's edge. Forest covers most of the land, but at the lower levels clearings have been made and utilized mainly for pasture.

ranges with peaks rising sometimes almost from the water's edge. They emerge from a wide sub-marine platform which forms a rich fishing-ground; here cod are taken in great numbers, and on the coasts are drying-grounds and plant for obtaining the cod-liver oil. Salmon-fishing is also carried on in

many of the fiords of northern Norway. Tromsø is the chief centre for the whaling and sealing fleets of the polar seas.

In a fiord behind the Lofoten Islands is the ice-free harbour of Narvik, from which is exported the iron ore of northern Sweden. Almost at the extremity of the Atlantic region is Hammerfest, the northernmost town in the world, a small trading centre and the site of whale-oil preparation.

Compared with most of the people of Europe, the inhabitants of this region, especially in the northern part, are unusually isolated, most of all during the long, dark winter.

The Scandinavian Highlands comprise two main areas which rise above the tree-line and bear only a scanty vegetation of the Alpine type.

The South-west Highlands include the most elevated parts of the Peninsula: the Hardanger "Fjeld" (i.e. high treeless plateau), the Jostedals "Brae" (i.e. ice-field) and the Dovre Fjeld. These are mainly broad and undulating, upraised penplains, above which stand occasional peaks of highly resistant rocks; e.g. above the Jostedals Brae, Glittertind rises to over 8,000 feet. The ice of the plateaus works outwards on all sides, and is not concentrated into a few valleys with long glaciers as in the Alps; hence the Scandinavian glaciers are generally short.

The highlands are of little use to man, except for some summer pastures, but there is some mining of iron and copper in Norwegian territory near the margins of the Trondheim Saddle and also near the Arctic Circle.

The highlands are penetrated and even cut right across by a number of deep valleys, as shown in Fig. 2; in these valleys settlement is possible and through them roads and railways have been constructed. The Gudbrandsdal (dal = valley), which leads northward from the neighbourhood of Oslo, is quite continuous across a flat water-parting with the Romsdal which drains out to a fiord of the Atlantic coast; these valleys are marked "Gd." and "Rd." in Fig. 68.

North of the relatively low Trondheim Saddle, through which coniferous woods extend across the whole Peninsula, the treeless fjeld reappears in the *Northern* or *Kiølen Highlands*. These are not so high as those of the south, and because of the lower precipitation of northern latitudes snow does not accumulate to form such extensive snow-fields as in the south.

On their south-eastern side the northern highlands have a marked descent, the Glint, to the Baltic slopes ; in the extreme north they jut out to the sea in the precipitous headland of the North Cape, though towards the north-east they descend more gradually to the tundra of the Arctic Coast.

A strip of tundra land is included in Norwegian territory (see Fig. 68), and here, at Kirkenes, are iron mines and ironworks and the terminus of the Norwegian coastal steamship service.

The Boreal Forest Region.—Immediately east of the Highlands is the little-utilized region of coniferous forest ; it is narrow in the south, but north of the Lake Belt of Sweden it occupies all the eastern part of the Peninsula and almost corresponds with the historic region of the Swedish Norrland.

The severity of the winter can be judged by the fact that the land is snow-covered for a period which lasts for four months in the south of the region and for seven months in the north ; the shores of the Gulf of Bothnia are blocked by ice for more than three months in the year. But one should note also the fact that the temperatures for July at Haparanda, at the head of the Gulf, are rather higher than those at Bergen (see p. 26).

Along much of the western edge of the region the Glint descends into a long shallow depression, where many of the river valleys are occupied by long lakes. Between the parallel river valleys the land gently rises to moderate heights which are covered by almost unbroken forests ; in the valleys glaciation has interrupted the smooth flow of the rivers, and falls prevent navigation but give water-power, which is being increasingly developed.

The Bothnian Coastal Belt is distinct from the greater part of the region, and is continued around the head of the Gulf and along the shores of Finland. It is of lower elevation than the rest of the Boreal Forest region, and since the Ice Age has more than once been covered by water when the area of the Baltic Sea was considerably greater than at present. Hence behind the present coasts are sandy and clayey deposits which yield more fertile soils than those of most of the Baltic Shield.

The severity of the climate along this belt is somewhat modified by the lower elevation and by the neighbourhood of the sea, and the valleys which cross the area have pastures and even some agriculture, especially in the south.

Forestry is the main occupation over most of the Boreal Forest

region, but some farming, in the form of cattle-rearing and the cultivation of barley, is carried on in the valleys of two areas in which both the soil and the climate are rather more favourable. These areas are the Bothnian Coast Belt, and Jämtland ("Jd" in the regional map), where the Trondheim Saddle permits Atlantic influences to show themselves and where the relatively low country has a cover of unusually fertile glacial deposits.

A railway has been constructed around the Gulf of Bothnia along the inland edge of the coastal belt, and it is connected with the sea-board by branches which run down several of the valleys. The small settlements of the coast have seaward traffic in the summer, and there is some industrial development. This is especially connected with the timber floated down the rivers from the interior, and there are many saw-mills and factories for the making of products such as paper, matches and cellulose.

In the north of Sweden are the greatest known deposits of high-grade iron ore in the world. This is quarried from what are literally mountains of ore, adjoining which the small towns of Gellivara and Kiruna have grown up.

The northern part of the Baltic Forest region is the home of the Lapps, the nomadic reindeer-herders who seek the highlands in the summer; some of them have now permanently settled by the rivers farther south in Sweden, where they fish and keep their herds near their villages, and still more of them live as fishermen by the Norwegian fiords.

The Farmed Forest Lands.—All the south-eastern area of Scandinavia, except Scania, is part of the region which is partly still forested, and partly cleared and taken into cultivation. As was explained earlier, its climate is of the sub-boreal type, with summers as warm as those of southern Britain, but with much colder and longer winters, and the natural vegetation cover is forest of the mixed coniferous and deciduous type. Much of this forest growth has now been replaced by meadows on which cattle are reared or by fields on which fodder crops and grain are produced; among the cereals, oats are the main object of farming, while rye and barley are grown to a less extent.

Within the area, however, differences of structure and relief are bound up with differences of soil and surface conditions, and it is largely because of these factors that some areas are fairly thoroughly utilized while others remain under forest. Also

there are mineral resources in some districts, and the location and outlook of other areas have led to their relatively dense settlement. On these grounds the following divisions have been made. There is a broad lowland extending from the Norwegian lands north of the Skager Rak eastward across Sweden; it may conveniently be considered as composed of the Oslo Lowlands in Norway (marked I in Fig. 68), and the Lake Belt of Sweden (marked II). South of the Lake Belt, in the division of Sweden known historically as Götaland, are the South Götaland Lowlands, and in their centre rises the Götaland Plateau.

The Oslo Lowlands.—The surface-forms of this region are largely the result of the great glaciers which worked their way down from the adjoining highlands to the hollow of the Skager Rak. Consequently the rivers have falls now used for water-power, while the lowlands in some parts show bare rock and in other parts have glacial deposits on which good soils have developed.

The subsidence of the area between the North Sea and the Baltic Sea has allowed the waters to penetrate the lower parts of the valleys of both the Norwegian and also the Swedish Lowlands; the resultant shallow inlets with gently sloping banks are known as fiords, although their characteristics are entirely different from the fiords of the Atlantic Margins.

At the head of the largest of these lowland fiords is Oslo, the capital of Norway. It has a convenient situation between the sea (though the harbour is closed by ice for about four months in the year) and the valleys which penetrate the highlands and give access to the Atlantic side of the country. The city is practically in the centre of the Oslo Lowland region, the most closely settled and agriculturally the most productive part of Norway. Moreover, at several parts of the area iron ore is mined and water-power is developed; there are scattered metallurgical industries, and works utilizing the products of saw-mills.

This economic activity is also found in Oslo itself and its neighbourhood, which is the most densely populated in Norway. With the trade and shipbuilding of the port, the capital has a population of about half a million persons.

The Lake Belt of Sweden.—Glaciation has had great influence on the land-forms here, as on the Oslo Lowlands, and in consequence there are such a number of small lakes that, like those of Finland, they can be shown only on maps of the largest scale. The existence and the general shape of the greater lakes, Vänern,

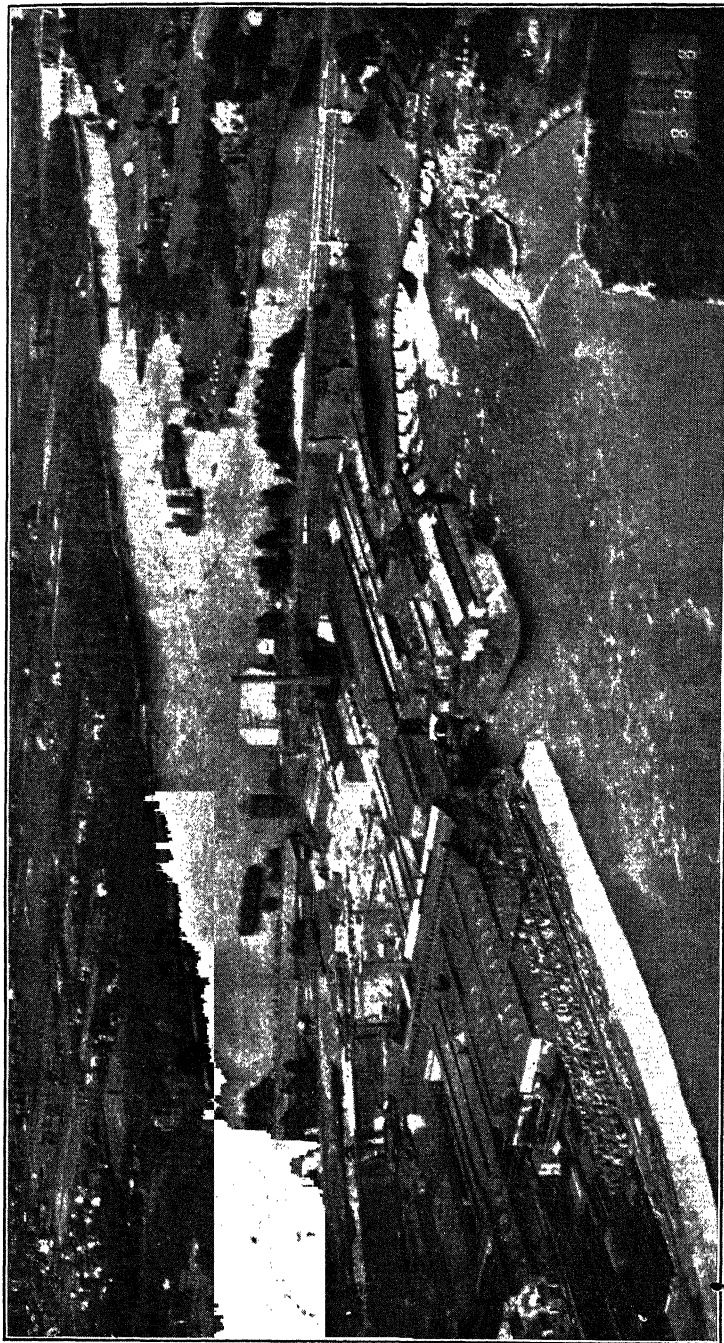


FIG. 70.—VIEW OF IRONWORKS BY THE RIVER DAL.

Note.—The works are situated where the Dal most closely approaches the iron mines of the Bergslagen. At this point the river has a marked fall which is used for water-power at the works, though fuel is also needed, as is shown by the high chimney in the centre of the view. The industry is here carried on in a semi-rural district of the "Farmed Forest" region in which the trees have not been entirely cleared.

[*Swedish Travel Bureau.*]

8 3 8

Vätter, Hjelmar and Mälaren, are due to faulting and the subsidence of portions of the Baltic Shield, as was explained in Chapter I, though the intricacy of their outlines is the effect of ice-action.

Another factor affecting surface conditions in the region is the occurrence of areas of recent sandy and clayey deposits, like those bordering the Gulf of Bothnia.

Because of the contrasts in surface conditions there are patches of almost barren rock, small areas of moorland, larger areas of uncleared forest, and very considerable stretches of farm-land, especially in the south. Climatic conditions are indicated by the figures for Stockholm in the table on p. 26, though in the west temperatures are a little more equable; the account of agriculture in the farmed forest region, as described on p. 263, is particularly applicable to the Lake Belt. As a whole, this region is the most productive part of Sweden, with the exception of Scania.

The mineral wealth of the region is also considerable. Copper is found on its northern margin, though the deposits at Falun are now nearly exhausted. Iron is mined near Dannemora on the Baltic side, but the main area of iron production, where ore is obtained from great open quarries, is the district known as the Bergslagen ("Bn" on the regional map). In this area, stretching from the north of Lake Vänern north-eastward to near the River Dal, iron has been mined and worked for many centuries. The industry was originally based upon the proximity of iron ore, fuel from the forests and power from the rivers; now the same factors are utilized, though by modern methods. The iron ore which is exported goes out largely through the port of Oxelösund, south-west of Stockholm, and to a less extent through Stockholm and through Gävle near the mouth of the Dal.

The remaining part of the iron ore is the basis of an important iron and steel industry in which machinery of many kinds is produced, and associated with this are other branches of metallurgy. The work is carried on at a number of quite small places as well as at several towns in the Bergslagen.

Water-power is obtained especially where the streams descend from the higher ground on the northern margin of the Lake Belt, and both at such points and at many others in southern Sweden there are works for the products of the timber which is floated

down the rivers or brought by coastwise shipping from the Gulf of Bothnia.

Thus there are varied forms of economic activity in the Lake Belt, and here live the great majority of the Swedish people.

Göteborg, in size approaching half a million people, is the western outlet of the region and the chief port of Sweden. It is the terminus of oceanic commerce, which avoids the shallow and winding waterways through the entry to the Baltic Sea. Moreover, Göteborg is in a favourable situation both for trade and also as a manufacturing centre, because it is at the mouth of the River Göta which drains Lake Vänern; in its course this river forms the great Trollhätta Falls, now harnessed for water-power. By the River Göta and by canals Göteborg has water-communication through the Lakes Vänern and Vättern across the whole region to Söderköping (i.e. South-market); this is a small port, at the head of a fiord on the Baltic Sea, near the larger port of Norrköping (i.e. North-market) (see the map in Fig. 68).

On the Baltic side of the Lake Belt is Stockholm, which, although not well placed for trading with western nations, has other factors in its position which have enabled it to serve as the capital of Sweden. It is about 30 miles from the Baltic Sea, at the head of an inlet where a group of small islands marks the transition to the long Lake Mälaren. Together, the inlet and the lake form a water-barrier stretching far inland and separating the Swedish settlements on the Baltic from those near the Gulf of Bothnia; the islands, however, give a means of bridging the barrier, and here Stockholm grew up. Also, until the nineteenth century Sweden extended across the Gulf of Bothnia and included what is now Finland, and thus Stockholm had a central position as the capital.

Because it has been built upon a group of islands, Stockholm has been called "the Venice of the North," and because of its beautiful situation and its splendid buildings it is regarded as one of the finest capitals of the world. With a population of three-quarters of a million, it is the largest city of the Peninsula.

The South Göta Land Regions.—Between the Lake Belt and Scania are the regions of south Göta Land. The marginal areas are like those of the Lake Belt, except that there is relatively little industrial or commercial development, but the central plateau rather resembles the Norrland part of Sweden. Its climate is less extreme than in the north, but its altitude, which

at one point is over 1,000 feet, and its rocky nature are unfavourable to agriculture and the forest remains uncleared to a greater extent than in any other part of southern Sweden. Lake Vätter penetrates the region, and at the southern end is the small manufacturing town of Jönköping ; there are a few other small industrial centres on the margins, but the population is scanty, and the people who get their living by agriculture have a poorer return than those of the adjoining regions.

The plateau and even the more favoured lowlands of south Götaland stand in marked contrast to fertile Scania, which was described in the chapter on the South-West Baltic Lands and is indeed the most densely populated region of all Sweden.

Spitsbergen.—This island group, officially known as Svalbard since it was assigned to Norway in 1920, lies about half-way between North Cape and the North Pole. It has a complicated geological structure and a correspondingly complicated relief ; there are fiord coasts, and at one point the land reaches an altitude of over 5,000 feet.

Even at the high latitude of 80°, the North Atlantic Drift has a warming influence, and while glaciers cover much of the surface the lowland areas have a tundra-like vegetation and reindeer and foxes can find a living. By the coasts polar bears and walrus are hunted and the down of eider ducks is gathered by a few people. The main resource of Spitsbergen is the occurrence of great deposits of good coal, which is mined throughout the year, giving occupation to a few thousand persons, and exported during the summer when navigation is not impeded by ice.

Iceland, which just touches the Arctic Circle, is also greatly influenced by the North Atlantic Drift, and its climate may be broadly compared with that of the northern part of Norway. Although built of volcanic material, its relief in general resembles that of north-western Norway, for most of it is a plateau bordered by fiords. Its highlands are covered by ice-fields and lower areas are tundra-like ; in the south there a few trees, pasture for horses, sheep and cattle, and fields where vegetables are grown. A population of under 200,000 people depends less upon farming, however, than upon occupations connected directly or indirectly with the sea. Fishing comes first ; cod are taken in great quantities and to a large extent are salted and dried, and exported to Mediterranean countries, while cod-liver

oil is another important product. Trade and industries are also significant occupations, and about a third of the people live in the capital, Reykjavik.

Iceland was settled many centuries ago by Scandinavian seafarers, and has been under the rule of Norway and Denmark in turn. Since 1944 it has been an independent Republic.

QUESTIONS

1. Describe the Scandinavian Highlands and examine their influence on the geography of the other parts of the Peninsula.
2. Write an essay on "The Norwegian Fiords."
3. Indicate, and briefly account for, the different types of climate experienced in Sweden.
4. State the distribution, and give an account of the utilization, of the mineral resources of Scandinavia.
5. Describe and explain the differences in the nature of the farming in various parts of the Scandinavian Peninsula.
6. Examine the sites and the functions of the chief ports of Norway and Sweden.
7. Make a systematic study of the lowland which includes near its margins the towns of Oslo, Göteborg and Stockholm.
8. Trace the influences of glaciation upon the Scandinavian people.
9. Compare and contrast the natural resources of Norway with those of Sweden.

CHAPTER XVII

EASTERN EUROPE

THE broad characteristics of the regions of eastern or Trunk Europe were described in the first part of this book, and in this chapter further details will be given, especially in connexion with the economic geography. Attention may well be directed particularly to the changes which have occurred in recent years, for in eastern Europe developments have been rapid.

In the old Russian Empire both social and economic conditions were in general behind those of the rest of Europe, and the developments which did occur were limited in the main to the western margin of the Empire into which people and ideas had come from Peninsular Europe. Thus when peace was established after the war of 1914-1918, and the new States adjoining Peninsular Europe (Finland, the East Baltic States and Poland) were formed, these countries were able to continue developments already begun.

In the rest of the Russian Empire only three regions stood out as markedly affected by western advances: (i) and (ii) round Moscow (Moskva) and St. Petersburg (Leningrad), where manufacturing had been started; (iii) the Ukraine, where cultivation, especially of wheat for export, had been fostered by the great land-owners, and where the iron of the Dnieper district and the coal of the Donetz basin were mined partly for use in the more northern industrial district and partly for manufacturing near the shores of the Black Sea and the Sea of Azov. Elsewhere there were but small-scale mining and manufacturing works, and there was little traffic with other countries; even farming, which was the occupation of the vast majority of the people, was carried on by simple and in some parts even primitive methods.

On the other hand, the natural resources were great, and there was therefore opportunity for great improvements. Moreover, the new Communist Government took over the ownership and management of all the natural wealth of the country, together with the organizations, such as the farms, mines, factories and railways, by which it was utilized. The rulers of the State made

a comprehensive review of the resources, and organized their development in successive "five-year plans," beginning in 1928. With the aid of foreign experts, large numbers of Russians were trained in new methods, production was pushed on by every possible means, and there resulted much geographical redistribution of industrial and agricultural activity.

In connexion with industrial developments, mining was increased or begun in a number of coal- and metal-bearing regions, the water-power of rivers was harnessed, and manufacturing was extended from the previously restricted districts to wider areas, particularly near the Ural Mountains, in the steppe-lands of European Russia, in Transcaucasia, and in Asiatic Russia where coal and metals were found. (See Fig. 80 on pp. 348 and 349, and Fig. 82 on pp. 364 and 365.)

In farming, too, improvements took place, and in particular, agriculture was extended into the forests of the north, into the drier steppe-lands of the south, and by irrigation even into the semi-deserts. It is scarcely too much to say that in the space of twenty years from 1917, Russia experienced at the same time a political revolution, an industrial revolution and an agrarian revolution.

The major regions are determined mainly by climatic factors and correspond broadly to the natural vegetation regions; hence the names of the larger regions as given in the map in Fig. 19. The subdivisions of these regions are more influenced by differences of relief, structure and surface conditions, and they show consequent differences in the utilization of the land. The major regions are so vast that a complete survey of each is quite impossible; only the most important features, and a few of the outstanding subdivisions, can be described in the text or indicated as separate regions in the map in Fig. 71.

The Tundra.—In this region there has been little development; away from the ports referred to below, the few inhabitants are the Lapps in the west and the Samoyeds in the east, who live mainly on the products of their reindeer and by fishing.

The wet Tundra is a barrier to communication when the coast is open in the summer; it is crossed where help is given by rivers and inlets, and at such places a few small ports have been made, for example at the mouth of the River Pechora in the east and at Kola Bay in the west. The latter inlet so benefits from the North Atlantic Drift that its mouth is ice-free during the



FIG. 71.—REGIONS OF EASTERN EUROPE.

Note.—W indicates the White Russian Republic; U, the Ukraine; T, the Transcaucasian Republics.

N.B. In the Second World War the boundaries of U.S.S.R. were thrust westward from the positions shown above: (i) in Finland; (ii) to near the western limits of the Farmed Forests and Steppe regions.

whole year, and with the aid of ice-breakers ships can always reach the port of Murmansk. Because this port is open when Leningrad is closed in winter, a railway has been built through Karelia to Murmansk. Moreover, a naval base has been established nearby at Poljarno to supplement that at Kronstadt, the island near Leningrad in the Gulf of Finland, where war-ships are immobilized during part of the year.

The Boreal Forest.—In the European portion of this great region, three sub-regions may be distinguished. In the west is the area of the Baltic Shield marked by the occurrence of innumerable lakes; east of this is the region, largely lowlands, where the forests resemble those of the Siberian taiga; separating Europe from Asia are the Ural Mountains, which cause the forest area to bulge southward into the steppe-land.

The "*Lake-Shield Area*" may be a convenient term for the western sub-region. Politically it is divided between Finland, whose territory consists, except in the extreme north, of the basins of the streams draining to the Gulfs of Bothnia and Finland, and Russia, which occupies the easterly portion draining to Barents Sea and the White Sea or through Lakes Onega and Ladoga to the River Neva.

In several respects this sub-region forms a unity and shows a similarity to the Scandinavian part of the Baltic Shield. The forest trees are the same species as those of Sweden, and they yield timber which is the chief product of considerable areas. In the north the ancient rocks contain minerals; in the Kola Peninsula, in Russian territory, ores of iron, nickel, aluminium and phosphates are mined, and with the aid of electricity, obtained both from water-power and from peat-fuel, metallurgical and chemical industries have been established within the Arctic Circle. (See Fig. 80 on pp. 348 and 349.)

To meet the local needs of fresh vegetable food and milk, scientific methods have been attempted to hasten the growth of the desired vegetables and hay, and even of barley and wheat; at present this process is relatively costly, and can be carried on only upon a small scale.

The region has been heavily glaciated and the resultant innumerable falls and rapids have been utilized for obtaining electricity in many places in the Finnish area. Glaciation is responsible, too, for the other features of the "lake plateau" of Finland. Here there is an indescribable complexity of water-

surfaces : lakes of most intricate shape are set with numberless islands and interconnected by a maze of water-courses. These lakes alternate with swamps, and it is significant that the Finns name their country "Suomi," which is translated both as "swamp-land" and "lake-land."

Roads through the Lake Plateau region are often made upon the long winding eskers which stand like dykes above the waters. In the Russian region of Karelia a canal has been constructed from the White Sea, utilizing lakes and rivers in its course, to

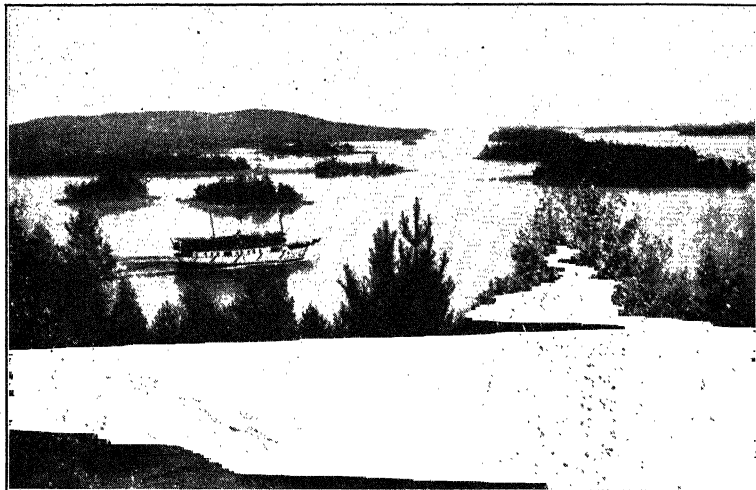


FIG. 72.—VIEW ON LAKE PAIJANNE, FINLAND.

[F.N.A.]

Note.—This is one of the larger lakes immediately behind the morainic barrier separating the Finnish Lake Plateau from the coastal plain of South Finland. The view shows the irregular though low relief of the region, and some of the innumerable islands in the lake. In the foreground birch and spruce trees are seen as components of the Boreal Forest which still covers most of the land, and a steamer suggests the use of the water for communication.

reach Lake Onega; farther to the south, other canals and rivers complete water-communication through Lake Ladoga to Leningrad and the Gulf of Finland, and also to the Volga river system and Moscow. In considering the use of the waterways, it must be remembered that in the neighbourhood of Lake Onega they are frozen from mid-November till mid-April.

The south-western part of the Lake-Shield sub-region is the most developed. Here in Finland the Bothnian Coast Belt resembles that of Sweden, and there are coastal settlements where saw-mills are driven by electric power and some farming is carried on. In the Finnish Lake Plateau, too, there are

scattered settlements where there are areas of relatively fertile glacial clay and recent marine deposits like those on the Swedish side of the Gulf of Bothnia ; such cleared "islands" in the forests give pasturage for swine and cattle and have small fields of barley and, in the south, also of oats.

Along the southern edge of the Finnish Lake Plateau the waters are ponded back by a double line of terminal moraines ; in crossing this barrier the streams have falls which give much power. Where Lake Saima is drained to Lake Ladoga are the famous Imatra Falls, and in the south-west of the region water-power is one of the chief factors which have aided the development of a number of small industries at Tampere (Tammerfors).

The "*Taiga*" Area in European Russia is in the main still a forest region, with only small and scattered clearings. Save for the Timan Uplands it is a lowland, with considerable stretches of swamp. Most of the region drains northward, the largest rivers being the Dvina and the Pechora ; the south-east part drains to the Volga, mainly by the Kama. These rivers aid transport and the Dvina and Petchora are planned to connect by canal to the Kama, but like most of the other rivers of Russia, their navigation is subject to much interruption ; when ice-covered, they can be utilized by sledges, but in spring floods render them useless, and in summer the lowness of the water may seriously limit traffic.

Timber is the main product of the region, and in the north its chief shipping port is Archangel, at the mouth of the Dvina ; much timber is also obtained from the southern part of the Boreal Forest region where it adjoins the better-populated areas requiring this commodity. In this southern part railways have been constructed, and from it a line goes north to Archangel. There is little mineral wealth in the region, though a coalfield has been discovered in the Pechora basin near the Arctic Circle.

Because of the climate and soil conditions, farming is restricted to very small areas save on the southern margin. Moreover, as it is generally carried on by relatively backward methods its return is rendered the more scanty ; the population is small and lives in poor, indeed often squalid, circumstances.

The *Ural Mountains*, because of the moderate uplift of the Hercynian massifs which form them, nowhere reach 6,000 feet in elevation, and in the central section the watershed between the European and Asiatic rivers is little over 1,000 feet above

sea-level. Also the tilt of the upraised peneplains is generally slight, especially on the European side, and hence these mountains do not form a difficult barrier between the continents.

Railways cross the Northern Urals to Sverdlovsk, and the Central Urals by the industrial centre of Zlatousk to Chelyabinsk on the eastern flank (see map, pp. 332-333). Another crosses the Southern Urals to Magnitogorsk.

The forests of the Ural region are valuable, and timber is still an important product ; as a source of fuel it was one of the factors which aided the growth of industries in this far-distant border of Europe, but the mineral resources of the region are the main cause of its economic development.

In the south is the broad, longitudinal valley of the River Ural ; the neighbourhood of this river at Orsk, just beyond the limits of the mountain region, yields deposits of iron ore containing also chromium and nickel. With the aid of an electric power-station and of oil brought by pipe-line from Emba in the Caspian basin, a group of closely linked chemical and metallurgical industries, the latter including the construction of locomotives, has been organized in the district, and a considerable population has settled in what was until quite recently an almost uninhabited area.

Farther north, in the same valley, a similar industrial development has occurred at a newly created large town, Magnitogorsk, named after the magnetic iron ore to which it owes its existence, while manganese is another mineral obtained in this district.

In the Urals near Zlatousk and Sverdlovsk, ores of iron, copper, aluminium, nickel and gold are found, and east of that town are deposits of brown coal. Hence in this section exists another industrial region, important also as being linked by railway on the one side with other sources of mineral wealth in central Asia, and on the other side with the manufacturing and consuming regions of Europe ; Sverdlovsk itself has a population of well over half a million people.

There is less development north of this region ; yet brown coal, oil and iron are obtained and there are great deposits of potassium salts. The industrial centre is Molotov (formerly Perm) east of the uplands on the Kama, from which water-power is utilized for varied purposes.

Centuries ago, the mineral wealth of the Hercynian massifs of central Europe drew people to their neighbourhood ; now their

resources are largely exhausted while those of the similar areas in the east of Europe are in their turn transforming a wilderness.

The Farmed Forest Regions.—While the coniferous forests have been cleared only in patches, the “mixed” forest region, with its better climate and soil conditions and its easier accessibility from central Europe, has been far more thoroughly utilized. Yet different types and different degrees of development may be observed in the following areas :

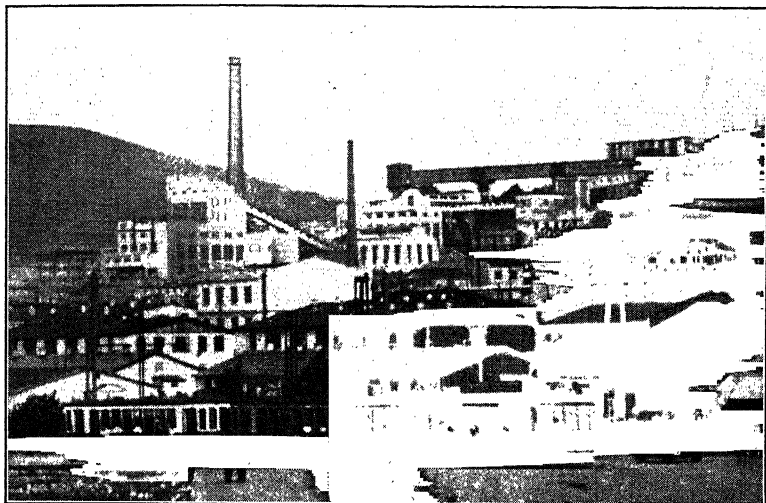


FIG. 73.—VIEW IN MAGNITOGORSK.

[E.N.A.]

Note.—The upper Ural River occupies one of the longitudinal valleys which dissect the broad plateau-like elevations of the Southern Urals. Overlooking the valley the height “Magnitnaya” contains one of the greatest deposits of iron ore in the world, and near it the first “Five-Year Plan” created a new town, Magnitogorsk, centred upon the great “Stalin” metallurgical plant, part of which is shown in the view. Coal is brought from the Kuznets field in southern Siberia, the iron and steel works are closely related to other metallurgical industries, and with the workmen brought from western Russia the settlement numbered about a quarter of a million people within a few years of its establishment.

The South Finland Coastal Plain.—North of the Gulf of Finland the ancient rocks of the Baltic Shield are largely covered by recent clays, which have been so well cultivated that this is the most productive part of Finland ; the farming is concerned mostly with the growing of oats and rye, and the keeping of cattle.

Off the coast is a swarm of small islands, continued across the entrance to the Gulf of Bothnia as far as the Aland Islands ; the islands and the small inlets of the mainland are the homes of many fisher-folk.

The streams which issue from the lake-land of the interior give water-power for many saw-mills and other works utilizing the timber, and for metal, textile and other industries in the small port of Turku (Åbo), and particularly in Helsinki (Helsingfors), the capital and the chief trading centre of Finland. Viipuri (Vyborg) is now within the U.S.S.R. boundary.

The East Baltic Lands.—South of the Gulf of Finland the strata of the Russian platform form a group of low plateaus which are separated by slight depressions generally marked by deposits from lobes of ice occupying these hollows in the Ice Age. Hence the Republics of Esthonia and Latvia and the north-eastern parts of Lithuania and Poland have plateaus farmed in much the same way as the coastal plain of Finland, but these alternate with lower and wetter areas, which still have a good proportion of forest and even marsh-land and lakes.

The most obvious of these lower areas is that largely occupied by the Gulf of Riga, around the margins of which are some of the less-productive farming districts. Yet the commercial advantage of the inlet has led to the growth of Riga, a short distance up the River Dvina. This is the largest city of the three small Baltic Republics, and its importance dates from the time when it was the centre of the German colonization of these lands ; to that colonization is due, also, the general appearance and much of the architecture of Riga and others of the larger towns.

In the early time of Russian rule over the east Baltic States, Riga had much trade, aided by the fact that it is closed by ice for a shorter period than Leningrad ; also, with the facilities for transport, there grew up manufacturing of textiles, metals and wood. When Russia was cut off from this outlet to the Baltic Sea, the activities of Riga were less, but it is again a port with much trade, and has increased industries ; it is the capital of Latvia, with about half a million people.

A port of somewhat similar history and circumstances is Tallinn (Reval) on a small inlet near the entrance to the Gulf of Finland. It is a smaller city than Riga, for it has only about 150,000 inhabitants ; it is now the capital of Estonia.

Another still smaller port is Liepāja (Libau) on the open coast of Latvia ; its artificial harbour served the Russians as a naval station because, not being in a river mouth at which ice would accumulate, it could be kept open for vessels during the winter.

In the interior is Vilnius, previously known as Vilna, only a small town although the capital of Lithuania.

As the influence of past German dominion over the greater part of the east Baltic countries is seen in the cities, so it is to be traced also in the agriculture ; hence farming in the east Baltic lands was more advanced than in the farmed forest region farther east, partly because of the peoples who have occupied it, but partly also because of the physical conditions.

The West Russian Lowlands.—The States of Estonia and Latvia are separated from Russia by a natural frontier as well as by a political boundary, for southward from Lake Peipus is one of the ice-lobe hollows, with lakes, marshes and forests. West of this barrier settled the Ests and Letts ; east of it spread the Russians. This part of Russia, however, is one of the less favourable areas for settlement, and poor conditions extend eastward to include the neighbourhood of Lake Ilmen.

Southward the land rises very gradually to the water-parting leading over to the basin of the upper Dnieper, where again the country descends to the Pripyat (Pripet) Marshes—the greatest swamp-region of Europe. Near the River Dnieper the land has now been largely drained and utilized, but its tributary the Pripyat still flows sluggishly through the vast marshes ; swamp-woods alternate with wet and sometimes flooded marsh-lands, and only here and there small sandy islands rise above the uninhabited lowlands.

Here again surface conditions have affected political boundaries, for this region, once a “ no man’s land,” separated Poland on the west from Russia on the east ; moreover, while the White Russians occupied the region to the north-east, the Little Russians settled on the south-east, and consequently the boundary between White Russia and the Ukraine also runs through the marsh-land—now entirely in the U.S.S.R.

The North-West Russian Entry-land.—East of the head of the Gulf of Finland is another region which has generally poor resources in itself, but in this case is important as being for over two centuries the main entry into Russia. Here Peter the Great founded a new capital in the swamps at the mouth of the River Neva to be in touch with the western nations, from which the older capital, Moscow, could in those days be reached only with difficulty. In spite of the unpleasant and even unhealthy

site, and in spite of the winter-closing of the port, Petersburg, later renamed St. Petersburg, justified its creation.

Inland communications from the port were gradually improved, beginning with roads leading to Moscow and the other important towns of central Russia. Canals have been cut across the low water-partings to join the Neva to the Volga and the other great river systems of the country ; the most important of these canals are those leading to the Volga and thence to Moscow, as shown on the regional map in Fig. 71. Railways have also been built across the swamps, and that constructed from St. Petersburg to Moscow appears on a map almost as a straight line.

Trading, shipbuilding and armament-making were the first economic developments at St. Petersburg, and when manufacturing was introduced into Russia, textile and other factories were established there. With its importance as a capital and residential city, St. Petersburg had a population of well over 2 millions before the fall of the Russian Empire.

After the revolution the seat of government was again transferred to the earlier capital, Moscow. The city on the Neva was renamed Petrograd, and with a temporary cutting-off of most of the trade between Russia and other countries, it suffered severely and the population diminished to about $1\frac{1}{2}$ millions. Then came the third stage of its history : it was called Leningrad, and with the resumption of foreign trade and the new industrial developments in Russia it has again grown ; now Leningrad probably has 4 million people. (Many statistics relating to the U.S.S.R. are either out-of-date or of doubtful accuracy.)

The Central Plateaus.—Near Lake Ilmen, the West Russian Lowlands are overlooked by the scarp of the Valdai Heights, which, capped by part of an end-moraine, reach a height of over 1,100 feet. The Valdai Heights, lake-studded and forested, descend southwards to a region of broad, low plateaus ; towards the east these plateaus are drained by the Volga, its tributary the Oka, and a tributary of the latter stream, the Moskva, on which Moscow stands.

As a whole this low plateau region is now farm-land. Until recent years, rye was the main crop, but as methods of agriculture are being improved, wheat, being a more valuable grain, is being increasingly sown. Industrial crops, too, are cultivated in greater variety and to a greater extent than formerly ; flax

and hemp are of special importance. The rise of industries in the neighbouring regions has stimulated also the demand for vegetables and dairy produce.

The Moscow-Gorki Industrial Area.—From Moscow eastward to Gorki (formerly Nijni Novgorod) is a region marked by industrial development ; it overlaps the Central Plateaus near Moscow and forms a great triangle stretching eastward between the upper Volga and Oka to Gorki at their confluence. The modern development arose here partly because of the existence of these two important cities of old Russia.

About seven centuries ago Moscow became the capital of what was then the relatively small State of Russia ; like many other cities, it originated where an island made a convenient crossing-place on a river, and in Russia the rivers formed the easiest means of communication. As in the case of other capitals, too, the extension of the territory ruled by its princes led to its increase in importance, and to the river routes were added roads which radiated from it to all parts of the State.

In spite of the removal of the Government to St. Petersburg, Moscow, which was situated almost in the centre of Russia, remained the ecclesiastical capital of the country and in other ways kept its position as the centre of the national life and traditions. When the Russian power extended southward over the steppe-lands and eastward over Siberia, and when railways were built from Moscow to all parts of the dominions, the central position became more important and the city continued to grow in size. Finally, when the Soviet Government was put back to Moscow and it became the seat of the highly centralized administration of the great State, it increased rapidly in importance, now has at least 5 million people within the city and is the centre of a wide conurbation.

The ancient citadel, the Kremlin, with churches and palaces, surmounted by cupolas and enclosed by a battlemented-wall, has become the site of the government buildings. Both within and beyond the residential area of Moscow many great factories, making almost all kinds of commodities, have been built.

The area between the Oka and the upper Volga was the heart of the country of the Great Russians, and scattered about it were towns in which small-scale manufactures gradually grew up ; these were largely of textiles using at first home-grown wool and flax, and then cotton which was brought from Persia and the

eastern Mediterranean up the Volga to the great fair-ground at Nijni Novgorod. After the Russian industrial revolution, this manufacturing industry employed large-scale methods, extended its range to all kinds of enterprises, and utilized varied sources of mechanical power.

The so-called "Moscow coalfield," which lies a considerable distance south of that city, in the neighbourhood of Kaluga and Tula, yields mainly lignite, and as a result of the more efficient use of this fuel, both the demand for it and the amount produced from the field have increased greatly; coal and oil from other parts of Russia are also employed. The water-power of the Volga has been harnessed, and even peat from the bogs is burned in specially constructed furnaces for producing electric power. Iron is got from the Kaluga-Tula coalfield and between this and Gorki. Based on these sources of supply, a number of industries have developed, especially those of cotton, linen and other textiles, and metal and engineering products.

Within this industrial area, as shown in Fig. 71, are about 100 manufacturing cities and towns; these include Gorki, with about three-quarters of a million inhabitants, and half a dozen others (marked by circles on this map) of about half a million. Yet even in this area the greater number of the people depend on agriculture like that of the Central Plateaus.

Also the industries have spread south where the Tula lignite deposits underlie the steppe, while factories have developed even as far away as the large town of Kazan on the Volga where it turns south into the steppe-lands. (See map in Fig. 80.)

The Steppe-lands.—Over the great extent of this major region there are marked differences both in the physical geography and in the economic developments. The broadest distinction is that based upon climate, and it corresponds to the division into the northern or forest-steppe and the southern or true steppe.

The Forest-steppe.—As a whole, the region of the forest-steppe, with its varied and abundant vegetation growing upon the rich black-earth soil, is the most favourable for cultivation of all eastern Europe; consequently the natural wooded grass-land has now been transformed into a country of farms and settlements. Characteristic of this belt is mixed farming, with a balance between the growing of crops for human use and the production of fodder for animals; among the grain-crops there

is also a balance between the cultivation of wheat and that of rye (refer back to Fig. 18).

The western section is mainly situated in the basins of the Dnieper and other rivers flowing to the Black Sea and in the basin of the upper Don ; as compared with the eastern section which is drained to the Volga, it has a higher rainfall and a rather longer period of warmth ; hence the normal yield of the harvests is greater in the west than in the east. Moreover, industrial crops, among which sugar-beet, hemp and tobacco may be specially mentioned, are grown to a considerable extent in the west, and here various fruits add to the abundance of the products.

The farming has been mechanized and, particularly in the west, is carried on by intensive methods ; it therefore supports a population which is dense for a predominantly agricultural region, although the numbers necessarily decrease towards the east. There are numerous towns of medium size serving as centres of local trade ; the chief large cities are Kiev, on the Dnieper in the west, and Kuibyshev (Samara) on the Volga in the east, and at both are varied industries.

Minerals are notable in two areas. (i) In the centre, near Kursk, iron ores have led to large metallurgical works. (ii) In the east, from near Kuibyshev to the Central Urals, so much oil is obtained at several places that this area, combined with others bordering the Urals, is known as " the second Baku." Ufa is a great refining centre.

Politically, the relatively narrow forest-steppe is divided between two of the Republics in the U.S.S.R., viz. the Ukraine in the west and the Russian Republic in the centre and east. To the south, the broader true-steppe has a less simple political relationship : the extreme south-west is Rumanian territory ; towards the centre is the Moldavian Republic of the U.S.S.R. ; then comes the Ukraine in the centre, and the Russian Republic controls all the eastern part.

Kiev, the capital of the Ukraine, is situated on the northern margin of the forest-steppe and has a population of about a million persons. Modern industries are aided by local occurrence of oil and lignite, but its origin dates from early times. Its position has favoured its development as a seat both of administration and also of commerce, for it is where roads which skirted the Pripyat Marshes (once greater than they are now)

crossed the Dnieper, which was for long one of the main means of communication of Russia.

The site of the kernel of the city was the high right bank of the river, for the Dnieper here shows the characteristic common to many of the larger rivers of the steppe-lands. The right or western bank of these rivers is the "hill shore" which overlooks the stream at a considerable height, while the left is the "meadow shore" liable to flooding in the spring; from this low level the country rises gradually eastward, rather like a dip-slope, to the undulating plateau which continues for many miles till it ends in the scarp-like hill shore of the next great river.

The Southern Steppe-lands.—The term "true steppe" may be applied to this region to describe the natural vegetation, but it may give a wrong idea of the present conditions, for much of the country is now under the plough and many large industrial towns are scattered over the western part of the region.

The southern, as compared with the northern, steppe-lands have higher summer temperatures, with less and more irregular precipitation, particularly in the eastern part, where aridity is a serious difficulty. The west is predominantly a grain-growing region, a part of the "maize and wheat belt" of Europe, though other crops have their place in the rotations; among these the sugar-beet and barley are important and the soya-bean has been introduced. Fruit and the vine are also cultivated.

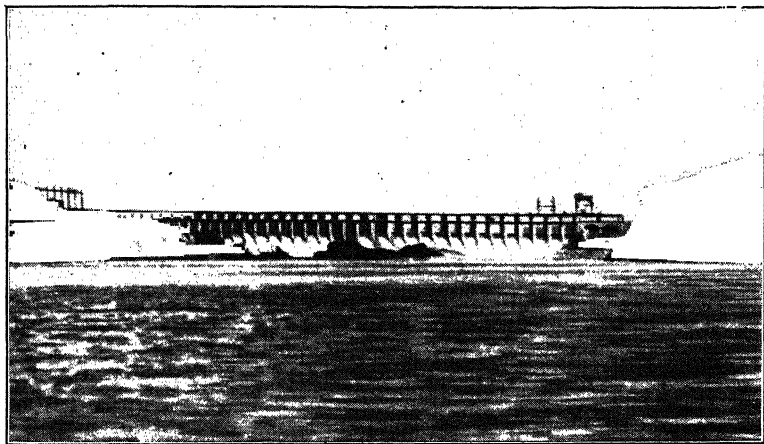
In the districts immediately to the north of the Black Sea and to the north and the east of the Sea of Azov, the lack of moisture is dealt with by "dry-farming" methods like those employed in the Middle West of North America, while irrigation is used where water can be diverted from the streams; by such means the range of products is increased, and vines and water-melons and even rice are obtained in the naturally dry areas. Cotton is a crop of great importance.

In the eastern part of the southern steppe, barley, millet and drought-resistant varieties of wheat are grown; over a good deal of the steppe-land, but especially in the east, sunflowers are cultivated mainly for oil contained in the seeds. In this drier country great changes followed the Revolution, by large collective farms using new methods and irrigation in previously almost unutilized areas; here, as in the west, planting of trees has been begun in order to serve as wind-breaks for the farm-lands.

Everywhere the keeping of animals is important, especially

cattle and pigs in the west, and in parts of the dry east sheep-rearing is the main occupation. With all the developments, there are still considerable areas where the land bears little, and except in the western part the population dependent upon agriculture is not great.

The Industrial South.—Mineral deposits and water-power are the basis of great industrial and commercial developments in three districts north of the Black Sea and Sea of Azov.



[E.N.A.]

FIG. 74.—VIEW OF THE DAM AT DNEIPROSTROY.

Note.—The belt of granite which outcrops across the course of the Dnieper not only causes rapids, but narrows the stream and provides a firm base for the dam. This ponds back the river and gives a supply of water for the canal which circumvents the falls and for the power-station which adjoins them. The view shows the overflow from the barrage and suggests the widening of the river below this point.

The region within the great bend of the Dnieper utilizes the iron ore found over a considerable area where the granitic belt rises from below the younger rocks of the Russian Platform as explained in Chapter I; moreover, within this bend lignite and manganese are obtained, while the granite belt is also responsible for the rapids which have prevented navigation in the southward-flowing reach of the Dnieper, but which have offered an enormous source of power. Near the newly created town of Zaporozhe, at the rapid known as Dneiprostroy, are great works which provide water for a canal connecting the upper and lower reaches of the river and for a huge hydro-electric station. The power pumps water for irrigating wide areas and for working farm machinery. Also based on this power is the "Dnieper

Combine " which consists of a system of works manufacturing many metal and chemical products. Above the rapids is the industrial and commercial city of Dniepropetrovsk, with over half a million people ; still farther upstream is the manufacturing town of Dnieprozerzhinsk. The centre of iron-mining is Krivoi Rog, and here metal-working is carried on with an exchange of ore from this region for coal from the Donetsk region to the east. (See maps in Figs. 79 and 80.)

This " Donbas " coalfield yields about half the total production of the U.S.S.R. and is broadly comparable with that of the Ruhr. Its output can still be increased, for its workable reserves are very great and include all-purpose bituminous and coking coals and anthracite. Huge power-stations make use of its coal. Salt, some iron, mercury and bauxite are also worked in this district. There are metallurgical, engineering and other works in many centres, and among the large towns are Stalino, of rapid growth to about half a million inhabitants, Makeyevka and Voroshilovgrad. The " Donbas " is densely populated and may be described as a " Black Country."

The third area of industrial activity is situated near the north shore of the Sea of Azov, where several towns take advantage of their facilities for transport by water, and of their proximity to supplies of metals and coal, for metallurgical and other works. Near the mouth of the Don is Rostov, where trading and varied manufactures support a population of over half a million ; farther west are Taganrog, Berdyansk and Zhadanov (formerly Mariupol). Coal is sent through Zhadanov to Kerch at the entrance to the Sea of Azov as a return cargo for iron obtained near that town ; hence at both places are iron and steel works.

Still other industrial developments have taken place in the southern steppe-lands, particularly at towns which have been for a relatively long period centres of local administration and commerce. Kharkov, an early base of Russian rule over the steppes, is now a great engineering city of a million people, while river communications have aided Voronezh on the Don and Saratov on the Volga. Stalingrad, a great producer of agricultural machinery, owes much of its growth to about the half-million level to its nodal position. Here, where the Volga turns to the Caspian, a canal links traffic both upstream and downstream to the navigable lower Don and so to the Black Sea.

The north-west of the Black Sea coast is the main entry and

outlet for all southern Russia, though trade is hampered by the formation of sand-bars across the river-mouths and by the accumulation of ice at midwinter. In spite of these drawbacks, Nikolaiev on the Bug grew to have a considerable export of wheat when, before the Revolution, the great landlords devoted much of their land to the cultivation of grain to be sent abroad and thus to bring them wealth.

For much the same kind of trade Odessa was made a port with an artificial harbour safely away from the silt and ice of any river-mouth; in recent years the development of the south of Russia has increased the variety and the amount of the commerce of Odessa, until it is now a city of over half a million inhabitants.

The "Mediterranean" Coasts.—In the Crimean Peninsula, the country becomes more arid and poorer in appearance towards the south, until it rises to the Yaila Mountains, whose heights are relatively well watered and bear woods both of deciduous and coniferous trees.

The southern coast, facing the Black Sea and protected from the north by the mountains, has much milder temperatures and a moderate rainfall in winter, while the summers are warm and dry; it is therefore a region of the "Mediterranean" type, and resembles the Riviera of France and Italy in its scenery, its natural vegetation, its vineyards and orchards, and its use as a health and pleasure resort.

This region is continued along the east shore of the Black Sea, backed by the slopes of the western Caucasus, until it merges into the Transcaucasian area with still warmer summers.

The Caspian Lowland.—This arid region has been utilized in several ways. Agriculture is mainly limited to areas which can be irrigated by rivers coming from better-watered regions: viz. the deltas and lower courses of the Rivers Volga, Ural, Emba and Terek, and the coastal strip where streams descend from the Caucasus south of the River Terek. Cotton is grown in these areas, and a beginning has been made with a mixed form of cultivation on the low, left bank of the Volga below Stalingrad.

The aridity of the region and saltiness of the soil have been made use of in the construction of large salt pans, into which water is drained and then evaporated, near the Volga.

Oilfields are developed at Emba and at Grozny; the latter has grown to be a large settlement on the border of the arid depression and the southernmost part of the steppe-land.

PART III

THE STATES

TABLE OF REFERENCE TO STATES

Chap. and Page	GROUP	STATE	Popula- tion (app.) mill.	Area (app.) 1,000 s.m.	Density of Popn. per. s.m.
XVIII p. 292	Maritime Margins (A) Northern Europe	Norway	3+	125	25
		Sweden	7	173	43
		Finland	4	118	34
		Denmark	4+	17	244
XIX p. 300	Maritime Margins (B) Western Europe	Netherlands	10	13	770
		Belgium and Luxemburg	9	13	725
		France	41	213	190
XX p. 314	Maritime Margins (C) Southern Europe	Spain	29	195	141
		Portugal	9	35	206
		Italy	47	117	400
		Turkey-in- Europe	1½	9	166
		Greece	7½	51	147
XXI p. 335	Eastern (Trunk) Europe	U.S.S.R.-in- Europe	160	2,100	76
		U.S.S.R. as a whole	206	8,708	24
XXII p. 353	East Central (Tran- sitional) Europe	Poland	25	121	206
		Czechoslovakia	13	49	265
		Hungary	9	36	256
		Rumania	16	92	174
		Bulgaria	7	43	160
		Yugoslavia	16	96	166
		Albania	1+	11	105
XXIII p. 377	West Central Europe	Switzerland	4½	16	275
		Austria	7	32	218
		Germany	WZ. EZ.	WZ. EZ.	WZ. EZ.
			48 18	95 42	505 430
			66	137	482
Continental Europe			500	3,800	132
Note.	{ Comparable figures for Great Britain and Northern Ireland		50	94	532

INTRODUCTORY NOTE

THE aim of the last part of this book is to show some of the more important ways in which the States of Europe are related to their geographical conditions.

Hence one must note the situation, the extent of the territory, and the geographical regions which comprise each State in order that its resources may be estimated, together with the possibility of exchanging a surplus production of some commodities for others which are needed.

Yet though a State possesses territory it is essentially a community of persons; therefore an understanding of its people is a matter of primary importance. Their racial origins and languages can be studied in relation to the position, growth and extent of the State. Further, the characteristics and ideas of the population are the main factor in determining the manner in which the natural resources of a country are utilized. (To appreciate this, one has only to contrast what North America was like when it was inhabited by a relatively small number of "Red Indians" with what it became after it was occupied by people of greater knowledge, more widely developed skill and quite different habits of life.)

In recent years the power of people to affect the geography of their lands has been increasingly taken over by the governments of their States. This is true in all parts of the world and perhaps particularly so in Europe. It is most striking in the eastern part of the continent, and in Chapter XVII some idea was given of the rapid and fundamental changes brought about by the Soviet Government after the revolution in 1917. The economic and social geography of the U.S.S.R. cannot be written without taking into account the ideas and methods of those who hold the political power, and similar conceptions lie behind the developments current in the transitional belt between Trunk and Peninsular Europe. Even in western Europe, although the governments do not dominate economic and social conditions as they do in the east, their policies must be considered in order to understand the present-day geography of their States.

Because of the various differences between the States, and

especially between west and east, Part III of this Volume has been arranged on the following plan. As is shown in the foregoing Table of Reference, the States have been grouped together according to their geographical position, for as a general rule those which are situated near one another show similarities in both their physical and human conditions. The States of Peninsular Europe which border the Atlantic and Mediterranean waters are similar in some respects but differ from one another, in the main, according to whether they have northern, western or southern climates, with the associated outlooks and human relationships; the States of these "Maritime Margins" are therefore put into three groups which are considered before the rest of the continent. The northern States and then the western ones are taken first because their conditions are broadly comparable with those of Britain; the more remote southern group follows, and here more differences are noted and discussed.

The "continental" parts of Europe, however, not only show greater contrasts, but they also have more political complications. To realize these conditions, it seems simplest to turn straight to Eastern or Trunk Europe and to study, as far as geography demands, the fundamentally Communist ideas of the Soviet Union. It is here that these ideas were first worked out in practice, and have most thoroughly influenced the lives and activities of the people. After this study it is easier to deal with the belt of East Central Europe, which is transitional in its geographical situation and appears also transitional in its social and economic transformation to a Communist system.

The remaining area, that of West Central Europe, is enclosed by the foregoing groups of States; it shares some of their characteristics and is influenced by them in varying degrees. A final note refers to some of the inter-State organizations of the continent.

Note.—In discussing the populations of the States, references are made to the tendency of some of them to increase in numbers and of others to decrease. This tendency is expressed by the use of the measures known as the "net reproduction rate" and "replacement rate"; these are mentioned in this book, but a fuller account of their meaning and significance to States is given in "A World Survey, from the Human Aspect" by the present writer in this series of "Systematic Regional Geographies". Also in the same book is given a fuller treatment of comparative standards of living which are here referred to in general terms in connection with the respective states of Europe.

CHAPTER XVIII

MARITIME MARGINS: (A) NORTHERN EUROPE

THE Danes, Norwegians and Swedes are in the main descended from Nordic racial stock and speak very similar languages. In the Middle Ages, the kingdom of Denmark extended over the whole region, and it was only gradually that independent kingdoms were formed in Sweden and Norway.

Before the industrial revolution allowed other States to support greatly increased populations, the Scandinavian nations had a relatively more important standing in Peninsular Europe. They rank among the most enterprising, best educated and most developed in social conditions of any of the peoples of the world. Their geographical situation has now left them rather away from the busiest commercial regions, but it has given them a degree of political isolation which has spared them some of the difficulties which many States of Europe have had in regard to their neighbours. In the Second World War, Sweden was able to remain neutral, but Denmark and Norway were overrun and occupied by German forces.

The Finns, on the other hand, are Asiatic in their racial origin and their language came also from Asia. Geographically they adjoin the U.S.S.R. and during the war they were attacked by Russia who annexed part of their frontier area. Yet because of its structure and climate, Finland in many respects is similar to parts of Sweden.

Norway.—Although the Norwegians in general show clearly the tall stature, long skull, fair hair and blue eyes of the Nordic racial group, along the west and southwest coasts there are among them rather shorter and darker people showing traces of Alpine immigrants who came very long ago. In the extreme north the population includes Finnish and Lapp elements.

The government of Norway is much like that of the United Kingdom of Great Britain and Northern Ireland. It is a limited monarchy with a Parliament which is freely elected by the people and enacts the laws. While all religions are tolerated, the

National Church is Lutheran (Protestant); secular education is compulsory.

The economic policy of Norway, like other features of the government, is similar in general though not in detail to that of Britain. For example, the Bank of Norway has been nationalized, and also the railways and the production of steel and aluminium. The chemical trust and most of the mining companies, although not nationalized, are controlled by the State, and electricity supply is in part under the Government.

"Social services" are much the same in the two States, and while the average standard of living is considerably higher in Britain, there is very little poverty in Norway. After the war there was rapid recovery from war damage, the merchant and fishing fleets were increased and improved, while the production of minerals and electricity was greatly developed.

In most kinds of work there is full employment, and in some branches labour is even attracted from abroad. As in Britain, the natural increase in population from one generation to the next, i.e. the "net reproduction rate," is less than the "replacement rate"; in other words, unless the birth rate shows a marked increase the total population will decrease as the present generation dies out. (This calculation does not take into account immigration or emigration.) At present the population is somewhat over 3 millions, and as the area of Norway is about 125,000 sq. miles, the density of population (25 persons per sq. mile) is very low—indeed, it is the lowest of any European State and is only about one-twentieth of that of the United Kingdom.

Two of the causes of the scanty population of Norway are: (i) the comparatively small development of industries; (ii) the fact that nearly three-quarters of the land is entirely or almost useless for the chief occupation of agriculture. The map of Norway in Chapter XVI shows that the very small proportion of cultivated land exists as tiny scattered patches along the Atlantic Margins, or as wider stretches in the Oslo Lowlands on the other side of the barren highlands and forested uplands.

It is evident that agriculture can support only a small population, but there are available also the forests, the fisheries of the extensive coasts, the abundant water-power of the margins of the highlands, and the iron, sulphur and copper ores of several districts. Since the war the Government has been much concerned with developing the resources of the northern part of the

State. Noteworthy is the construction of very large and closely associated plants for utilizing water-power on the north side of the Dovre Fjeld for electricity and for producing chemicals and aluminium ; also the extension of iron-mining at Kirkenes.

Moreover, the maritime situation of the country has been utilized by a people famous for their seafaring qualities, and the Norwegians possess one of the largest merchant fleets of the world. The foreign credits obtained by carrying goods of other countries increase the power of the Norwegians to import the food-stuffs which they cannot grow for themselves, the fuel and oil which they lack, manufactured goods, and the machinery needed for their small industries. Among the chief exports are timber and its products, pulp and paper ; fish ; metals ; manufactured metal goods produced partly from native ores and partly from ores obtained from abroad.

A considerable part of the overseas trade is carried on with Britain, with which the seaward outlook of Norway has favoured both commercial and cultural associations.

Sweden.—The Nordic origin of the Swedish people is shown very clearly in their physical characteristics. In the north are the relatively few nomadic or semi-nomadic Lapps who show Asiatic characteristics and speak a language of an Asiatic type.

The constitution of Sweden, like those of Norway and the United Kingdom, lays it down that its Government is a limited monarchy, associated with a parliament representative of the people. The King must be a member of the Lutheran Church.

At the present time the policy of the Government, like that common in Western Europe, is in economic affairs to combine State action and private enterprise. In Sweden, to a greater extent than in Norway, there are powerful companies on a capitalistic basis which carry on industries of most kinds, but the Government maintains a strict control over their profits.

The development of the resources of the country is at a high level, and this together with the skill and industry of the Swedish people has raised the average standard of living beyond that of most European States. In this connection it may be remarked that the Swedish policy of being neutral in the Second World War enabled it to escape the evils of warfare upon its own territory. Hence, although its industries, and especially its trade, were affected, it did not suffer the material damage and the great setbacks to which most countries of Europe were

subject. Indeed, in some respects it had the need and the opportunity of increasing its production during the period of isolation from much of the continent ; e.g. the amount of power obtained from its rivers was about doubled.

Structure and climate handicap the development of Sweden as they do that of Norway, and both States have very restricted



FIG. 75.—VIEW IN STOCKHOLM.

[Aerofilms

Note.—Stockholm grew up at a crossing-place, made easy by islands, of the waterway which connects L. Mälär with the Baltic Sea. The heart of the settlement was on the largest island, shown on the left of the view. The channels may recall the canals of Venice, and the design of the modern City Hall seen in the foreground was influenced by the architecture of the Venetian palaces.

areas of agricultural land. Yet Sweden has a larger production of food, especially from the fertile Scania region and parts of the Lake Belt. Its mineral deposits, too, are greater than those of Norway, and the industrial activity in its Lake Belt area is considerable. Nevertheless, the national economy is of the same general type as that of Norway and the external commerce has a similar character. The greatest export is of wood and its derivatives ; metal goods and machinery are sent abroad,

but there is a more than equivalent import of other commodities of the same group. Essential imports are food-stuffs and other animal and vegetable products, and textile raw materials and manufactured goods.

The agricultural and industrial production of Sweden, together with its larger area (173,000 sq. miles), enable it to support about double the number of people as Norway, viz. 7 millions. Yet the average density of the population is still very low, viz. only 43 to the square mile.

Moreover, the birth rate is extremely low ; indeed, it is among the lowest in the world. Hence the net reproduction rate is also low—about equal to that of Great Britain—and well below the replacement rate ; unless some marked and unexpected change occurs, the population of Sweden must decline in number. On the other hand, the standard of education and of culture in general is distinctly high—among the highest in the world. It can therefore be fairly claimed that quality, though not quantity, is a characteristic of the Swedish people.

Finland.—This State differs from the others of Northern Europe in the Asiatic origins of the people and their language. Also, it faces east to the U.S.S.R. and west to Sweden, and it has been subject to both of its more powerful neighbours.

For several centuries it was part of the Kingdom of Sweden. Its church is Lutheran and about one-tenth of the population, living in the south-western coastal strip, is of Swedish origin and speech. The adjoining Åland Islands are also inhabited by descendants of Swedish immigrants during past centuries ; these islands now claim independence, but an international Convention has assigned them to Finland on the condition of their having autonomy in local government.

Before 1917 Finland was a part of the Russian Empire, but with the fall of that Empire it proclaimed itself a Republic, and now has a President and a single elected Chamber associated with him in the government.

In 1939, when war had broken out in central Europe, Soviet troops invaded Finland and as a result the U.S.S.R. forced upon that State a Peace Treaty yielding to the Union : (i) in the far North, a “ corridor ” which had given Finland an outlet to the ice-free Barents Sea ; (ii) a large area of Finnish Karelia stretching across the Arctic Circle ; (iii) adjoining the Gulf of Finland and west of Lake Ladoga, territory which gave to the

U.S.S.R. a "buffer area" in front of Leningrad. Also, the Union obtained a 50-year lease of a now fortified headland of the Gulf of Finland at Porkkala, near Helsinki, which with Tallinn opposite could close that Gulf and protect Leningrad in time of war. These terms markedly affected the economic conditions of Finland. There was a serious loss in its limited amount of agricultural as well as forested land; also, about one-third of the developed water-power of the State was in the region where Lake Saima drained to Ladoga, and this went to the U.S.S.R. Hence more than one-tenth of the population of Finland had to be settled elsewhere, and it was very difficult to find, or to make, suitable land. Agriculture is by the nature of the country limited to only about one-twelfth of the total area, and also the climatic conditions make its harvests of oats, barley and rye unusually precarious. Much of the farmland yields only hay, and the keeping of animals is an important part of the work of the people. Finland therefore has to import food-stuffs for man and beasts, as well as various kinds of fuel, ores, chemicals and other raw materials for industries and to provide consumer goods; in return, her one great export is timber and wood products.

The natural handicaps of Finland have so limited its productivity that the population is only about 4 millions on an area of about 118,000 sq. miles, giving a low density of population—namely 34 per sq. mile, about equal to that of the Scandinavian Peninsula as a whole. But the birth rate is higher than in Norway and Sweden, and the consequence is that its net increase of population is only a little less than the replacement rate. In spite of hard work, the Finnish people can obtain but a relatively small return from nature, and their standard of living is low; to aid them, the Government takes an active part with Norway, Sweden and Denmark in a common planning of their legislation in social and cultural affairs.

Denmark.—Although the Danish people as a whole are regarded as of Nordic origin, they show the typical physical characteristics less clearly than do the Norwegians and Swedes. Their average height is rather less, and those individuals who are of shorter stature tend to have darker hair and eyes; this is evidence that they are of a different racial group, and it appears that before the Nordic immigration there was already a population akin to the Alpine peoples of Central Europe.

Apart from this difference, there are a number of similarities between the human geography of Denmark and that of the two Scandinavian States, especially in the speech and the earlier history of the peoples, their type of government and their educational systems. Denmark is different from Norway and Sweden, however, in having within its territory a minority population ; this is found in the isthmus of Slesvig which overlaps the frontier with Germany. As a legacy from the past there is on both sides a minority in an alien land, and an unsolved political problem between the two States.

The physical geography of Denmark shows striking differences from that of the Scandinavian Peninsula. Apart from the sandy and relatively unproductive western side, Denmark is a glaciated lowland which, after long and careful improvement, makes it a fertile agricultural and pastoral country. The climate, too, is more favourable than that of the more northerly lands, and the Danes have taken full advantage of the opportunities nature has offered.

Until the latter part of the 19th century Denmark was largely a grain-growing country, but the opening-up of the great farmlands of North America sent down the price of grain so much that Danish farmers could no longer compete. Therefore they turned mainly to the keeping of cattle ; they produced milk, butter and cheese for markets in nearby countries, and also other farm products such as bacon and eggs. To support the animals, cornfields were turned to pastures and also much food for the animals was imported from America.

The physical structure of Denmark afforded it no mineral wealth and its low relief gave no basis for hydro-electric power ; hence it could not develop manufactures on a large scale. Fishing, too, was not favoured by the sand-barred coasts of the North Sea, and the Baltic Sea does not support a large fishing industry.

There was only one other resource open to the Danes, viz. foreign trade, which had been a large factor in the growth of Copenhagen because of its position between the two seas. Yet even in this respect Denmark suffered a setback when rail communication improved and canals were constructed to join the seas and to connect the rivers on either side of the Danish peninsula. Nevertheless, Danish farming almost entirely supported a State which was as thriving as most of its neighbours.

Political and economic developments in other lands, however, have brought serious changes to Denmark in the course of, and after, the Second World War. At the beginning, its position led to its occupation by German troops when Norway was invaded. Even more serious injury to its economic conditions came with the after-effects of the war in other countries with which Denmark had traded.

Britain had to grow for itself more dairy produce when hostilities broke out and it continued to do so in the post-war period ; hence it did not need to buy so much from Denmark. Nor could it afford to pay the prices now required, as by this time the Danish farmers had to pay more to the American producers for the feed for their animals. Again, in the pre-war trade with Britain, and in return for the products of the animals, the Danes had bought coal from Britain. After the war, however, Britain had little if any surplus, and the price of coal, as of most commodities, had risen considerably.

Thus Denmark was again faced with a difficult economic situation. One way of meeting the challenge showed itself, viz. the establishment of secondary industries, a development which is also seen in the other States of Europe which had been mainly dependent on agriculture. For example, the " processing " of the farming products was continued, and efforts were made to develop the manufacture of textile and metal goods and machinery in which good workmanship might make up for a lack of raw materials and mechanical power. An old-established tradition of shipbuilding in Copenhagen was modernized, and it was hoped that this and other engineering work might have a market in the less-developed States of the eastern part of the continent. Meanwhile, the commerce of Denmark has remained largely with Britain, and is directly or indirectly concerned largely with its pastoral occupations.

On an area which is one of the smallest among the States of Europe, viz. 17,000 sq. miles, live over 4 million people. This represents an average density of population of 244 to the square mile—a relatively high number for a people mainly dependent on farming ; the average standard of living, too, is relatively high. As in the other countries of Northern Europe, the birth rate is distinctly low, and the replacement rate of the population is less than that sufficient to maintain in the long run the present number of the Danish people.

CHAPTER XIX

MARITIME MARGINS: (B) WESTERN EUROPE

The Netherlands.—It may be first pointed out that although “Holland” is frequently used to denote the whole of the State, it is properly the name of the two provinces, North and South, which occupy the sea-marsh-lands and bordering dune-lands between the western part of the Zuider Zee and the mouth of the Maas. Because of its situation, Holland includes the great ports of Amsterdam and Rotterdam, besides the capital, The Hague, and is thus the most populous part of the State.

The people of the Netherlands are as a whole derived from two racial stocks : the Nordic, which predominates in the north-east, and the Alpine, from which most of the people of the south and west appear to be descended. All now speak the Dutch language, one of the Teutonic group ; most of the people are adherents of one of the Protestant Churches, and about one-third are Roman Catholics. Politically, the Netherlands has a form of government like that of the United Kingdom : a limited Monarchy, with legislative power vested in two elected Chambers. The Government is centred at The Hague and it is almost entirely for this reason that the city has become nearly as populous as the two great ports.

As contrasted with Great Britain and the Scandinavian States, the Netherlands has undertaken less “State ownership” in economic affairs and relies more on “private enterprise”. There has indeed been marked and age-long enterprise in the Netherlands in developing the resources of the land against great natural difficulties. A review of the geographical regions and their present productivity allows one to understand both the pre-war economy and the new conditions now to be met.

The earlier sea-marsh-lands have been transformed by constant effort into polders of which large areas support cattle yielding milk, butter and cheese, while others produce flowers and bulbs ; to a less extent cereals and industrial crops are obtained from them. The river-marshes are now in the main

devoted to pastoral work. Inland, the moors have been made to grow chiefly potatoes and beet. Alone, these resources would have made the Netherlands a predominantly farming country.

However, the rivers formed waterways connecting the North Sea with much of the central part of the continent. Various forms of commerce developed : Rhine-borne trade with Germany ; overseas traffic with many lands, including the Dutch territories in the East Indies ; coastwise transit to and from other ports of north-west Europe ; the organization and handling of a large part of this commerce at Rotterdam and Amsterdam. In addition, much Dutch capital was invested in agricultural, mining and industrial companies in overseas territories, especially the East Indies, and the profits went to the people of the Netherlands. Finally, on the bases provided by the productivity and trade of the Netherlands grew up many forms of manufacture, and in recent years this was greatly assisted by coal from the Maastricht field. As a result, the Netherlands became one of the most highly industrialized countries of Europe.

All these resources and activities were disrupted by the Second World War. A great part of Rotterdam was destroyed ; also, much of the agricultural land of Holland was ruined by flooding, including the Wieringermeer, the first of the vast polders recently reclaimed from the Zuider Zee. The man-power was disorganized by forced transference of workers to Germany, and trade and industry were very seriously affected. Moreover, in the East Indies there were first the occupation and destruction by the Japanese, and then the revolt of the Indonesians and the formation of an independent government. Hence the colonial trade and financial interests of the Dutch were greatly injured or destroyed. In regard to the Netherlands economy as a whole, it may be said that though material damage was quickly made good, trade and production which had depended on conditions in other lands appear to have suffered permanent loss.

The area of cultivated land was increased as compared with that of pre-war times, but the type of cultivation had to be modified. The growing of grain needed for consumption at home was given more attention ; so also were the potato and beet crops of the moors, and the produce of market gardens. On the other hand, luxury products for export had to struggle against the loss of markets which could no longer afford to buy at the increased prices which applied everywhere to practically

all commodities. Industries were now handicapped by the shortage of labour, in particular of skilled labour, and by the necessity for buying large amounts of raw materials—very little of which is obtained within the country. This was difficult, as much capital was required for reconstruction, and at a time when much had disappeared in the Dutch East Indies enterprises. Particularly serious to the Dutch economy was the loss to shipping and commerce. For example, before the war three-quarters of the trade of Rotterdam was with Germany by way of the Rhine, but only a fraction of this survived the chaos in Germany. On the other hand, Rotterdam has gained to some extent because it has become a main port of entry for oil which is now imported into Europe in far greater amounts than in pre-war times. The loss of Indonesia as a possession meant not only a reduction of financial assets but a decline in the carrying trade to the Far East, for the earnings of the Dutch merchant marine had been an important item in the balance of trade of the Netherlands as a whole. Broadly speaking, however, the economic future of the Dutch people depends more on that of Germany than on any other factor.

The well-balanced economy of the Netherlands, and especially its broadly based industrial system, enabled this State which has an area of only 13,000 sq. miles (less than that of Denmark) to support about 10 million people. Hence the average density of population is about 770—the highest of any State on the continent ; it is even slightly higher than that of the 1951 census of England and Wales, which gave 750 persons to the square mile. Moreover, the birth rate is so high that the Netherlands is (with the exception of Eire) the only State of north-western Europe with a net reproduction rate above the replacement rate. Hence there is every prospect of an increase in the population of the Netherlands for a long period. Hitherto, the Dutch people have been able to maintain themselves at a higher standard of living than those of any other European State, with but two exceptions : Switzerland and the United Kingdom.

Belgium.—Although Belgium is a small State, a journey across it from north-west to south-east shows at least seven belts of country differing in their natural resources and their utilization by man.

(i) Behind the strip of dunes lies that of the reclaimed sea-marshes, together giving a living to fishers, farmers and the

traders of small ports. (ii) Inland comes a broad belt of plains, with varied agricultural and pastoral work ; also there are many towns, including Brussels, the capital, almost in the centre of this region. (iii) On the north-east are the moors, relatively infertile but with the Campine coalfield. (iv) Crossing the plains are the valleys of the Schelde and its tributaries ; these lead northward to the great port of Antwerp—the largest of a number of trading cities along the courses of the Schelde system. (v) The coalfields belt in part follows the valley of the Sambre-Meuse and has given rise to a considerable number of industrial settlements, the largest being Liège. (vi) The Ardenne Plateau yields the more hardy crops and some timber. (vii) The limestone scarp-lands, where Belgium borders France and Luxemburg (see Fig. 76 on p. 307), supply iron-ore deposits to these three States. The varied resources of these differing areas give the natural bases of the State. What, now, of the people ?

Two racial groups worked their way into this area, centuries ago, and their descendants show contrasts in physical appearance, languages and a number of social and political ideas. No hard-and-fast boundary can be drawn between them, yet a line from east to west through Brussels gives a generally useful guide. On the north side of this line in Flanders and the other provinces of northern Belgium are found the Flemings, who represent the Nordic strain from the lower Rhinelands ; their culture has Teutonic affinities as shown in the Flemish language, which is akin to Dutch, and their architecture recalls that of the Netherlands and North Germany. On the south side of the line the people are mainly Walloons largely of Alpine origin ; their language is French and they show other similarities to the people of the neighbouring part of France.

The territory now comprised in the Belgian State has had a chequered history. It was long ago described as “ the cockpit of Europe ” in which neighbouring Powers fought one another, and from 1815 till 1830 was a part of the Netherlands ; then a revolution brought it independence. The new State was a limited monarchy, and there are two official languages—French and Flemish. There is no official religion ; the majority of the people are Roman Catholic, while a smaller number are Protestant.

As the Flemish people occupy the northern area, their modes of life are specially related to the intensive type of agriculture

and the commercial work of the river ports ; these are the older forms of economic activity in Belgium. Of much more recent growth have been the mining of coal and iron, and the various branches of manufacturing and trade based on mechanical power, which are common in the central and southern parts of Belgium. Hence there has been a tendency in recent decades for the Walloons to increase more quickly than the Flemings, though it is probable that the latter at present have a small majority in the total population.

The interests of the two sets of people are different in some respects. On the whole, the Flemish part of the population is conservative in politics, and the growing Walloon part tends to be more "advanced" in their views. In economic affairs the policy of the Belgian Government, as in Western Europe generally, favours State control or management of certain branches of industry.

The resources of Belgium form a balanced economy, and as they exist in close proximity to one another the greater part of the land offers abundant means of production. Hence a total area of a little less than 12,000 sq. miles supports nearly 9 million persons ; thus there is an average density of population of about 760 to the square mile—second only on the continent of Europe to that of the Netherlands. But the net reproduction rate of the Belgian people is well below replacement level, and it appears to be decreasing further ; hence the present increase in total numbers will probably be reversed in future census returns. The average standard of living in Belgium is about that of the other States of north-western and northern Europe (excepting Finland).

In the latter part of the 19th century the King of the Belgians managed to get a share in the "scramble for Africa," and was recognized by European States as Head of the Congo Colony. This action brought to the Belgians sources of mineral wealth in central Africa which became of increasing value, particularly as uranium ores were first worked to produce radium and later were exported to the United States. Moreover, as one of the troubles of much of post-war Europe was the difficulty of obtaining dollars with which to pay for importing goods from America, Belgium was in the fortunate position of having at its disposal the Congo minerals to balance its imports. Hence the financial situation of Belgium has been better than that of the

other European States and it did not need to make any great change in its economy. As a predominantly industrialized State, it could continue its normal imports of raw materials and food-stuffs, and exports of manufactured products.

A marked contrast between Belgian post-war conditions and those in the Netherlands was that the trade of its great port, Antwerp, was not affected as was that of Rotterdam. The material damage was not so devastating and, more important, the general commercial activities of Belgium were not so disrupted as in the Netherlands by the chaos into which Germany fell in the years following the war.

Luxemburg.—There is a very close economic connection between Belgium and Luxemburg. This State, with an area of only 999 sq. miles and a population of about 300,000 persons, at the close of the First World War appeared too small to stand alone between its contending neighbours. A referendum was taken and a customs union was arranged by which goods could pass freely between Luxemburg and Belgium. The territory adjoins the south of Belgium and its southern part lies within the limestone scarp-lands. Hence Luxemburg has a considerable share in the iron deposits of this region, and mining and metallurgical industries form a large part of its resources.

Luxemburg is still an independent constitutional monarchy under its Sovereign, the Grand Duchess. For many generations the people have lived in an area bordering both the Germanic and Latin cultural regions, hence the common speech is a dialect of German, while the official and administrative language is French, which is taught in all the higher stages of education.

France.—In contrast with the other States of the continent, France has had a very long unbroken existence as a political unit, and during several centuries the French people have been able to achieve a high degree of national unity. The only marked exceptions occur in relatively small areas in the east, where natural boundaries are lacking to shut off French territory from the mainland of the continent.

As stated in Chapter VIII, the Ile de France was the heart of the Kingdom of France and around it lie the great productive plains of the North French Lowland ; to the south-west are the productive and warmer lowlands of the Basin of Aquitaine, while adjoining these and projecting into the Atlantic waters is the less-favoured Breton Peninsula. The region of the Central

Plateau is also relatively infertile, yet here coal deposits and water-power have enabled industries to develop. On the eastern side of the Plateau and in marked contrast with it, is the Rhône-Saône Trough with varied resources, and the Mediterranean Region which, in its climatic conditions and its southern relationships, stands rather apart from the rest of the country. These six regions are entirely and undoubtedly French ; together, they have become the essential basis of the unity of the State.

The remaining areas are border-lands where political boundaries have been subject to change as the centuries passed. The Pyrenees are a natural boundary and so, too, are the Alps and Jura Mountains ; even in these highland regions the precise frontiers have not been determined by physical conditions alone, but also by the varying strength of the States which confronted the French military power. In the south of France, the effects of the past are still shown by languages overlapping the political boundaries : where the Alps reach the sea, Italian and French are both spoken along the Riviera coast ; the Basque language overlaps in Spain and France at the western end of the Pyrenees, and the Catalan language at the eastern end.

North of these highlands, the uplands have been so worn down or faulted that human movements across them have been less restricted, and in the course of history the Powers on either side have extended their rule now to this side and now to that. Thus the broken country situated between the Jura Mountains and the Ardenne Plateau has for very long been the debatable land between Latin and Teuton, between French and German States. The struggle has centred upon the province of Alsace, corresponding roughly with the south-west portion of the Rhine Rift Valley, and the province of Lorraine forming the adjoining portion of the West Rhine Scarplands.

Age-long conflicts for dominance of these provinces have been brought to a head in recent times by desire to possess the increasingly important mineral resources of Lorraine and the rich lands and commercial routes of Alsace. The last transfer of territory occurred after the First World War ; this is shown in Fig. 76, where the broken boundary line shows the earlier frontier, while the continuous one marks off the part of Lorraine and Alsace which Germany yielded to France in 1919. It should be added that at this time the German speech was still

dominant over most of Alsace and the eastern part of Lorraine, but this was a relic of the past, and the inhabitants of the disputed area now indicated their preference for French nationality, provided that they might keep their language and their cultural traditions.

North of the Ardenne Plateau, the French State has extended eastward and obtained the port of Calais and a large share of the North Sea Lowlands coalfield belt—thus acquiring its chief source of fuel and the foundation of its industrial development. In this connection it may be pointed out that a later-utilized basis of French industries is water-power mainly obtained from the rivers from the high

border-lands; the chief exception is the power derived from the Central Plateau. The physical contrasts between the regions of France provide a variety in its resources and give opportunity for a well-balanced economy in the French State.

There is a further geographical characteristic of France which has greatly influenced the French people and the French State. This is its situation in regard to other lands and the relatively easy approach from them into the interior by three routes: (i) the land-way in the south from the Mediterranean area; (ii) the land-way in the north-east from the plains of central and



FIG. 76.—BORDER-LANDS OF BELGIUM, FRANCE AND GERMANY.

Note.—The boundaries before the First World War are shown by a broken line; those after that War by a firm line. It will be noted that Germany lost to France deposits of potash, petroleum and iron. The Saar district, here indicated by a dotted line, is discussed in the text; see p. 383.

northern Europe ; (iii) the sea-ways of the west and north-west, used by shipmen coming both from the south and the north of Europe. These routes have brought into France migrations of differing peoples and cultures over thousands of years.

Of great importance has been the Mediterranean coastal entry. After very early immigrations of the short and dark peoples of the Mediterranean racial group, Greek and Roman settlements and conquests introduced the classical civilization and the Latin language which have largely served as the foundation of modern French culture. In addition to these movements from the south, and overlapping with them in time, " Alpine " tribes intruded in the east through gaps in the uplands of the continental area ; thence they spread over much of central France, but had less definite influence on its future.

The second great way of approach was utilized later by successive advances from central and northern Europe through the northern plains of France. Here peoples of Nordic origin and Teutonic speech entered and made their contribution to the present population of France and to the variety in its cultural wealth. Yet these northern incursions did not displace the Latin element which still predominates in the language and appears to a less degree in legal systems and the forms of society.

Meanwhile, the third means of entry had been having its effect, where the coasts and rivers of the west and north of France gave access from the sea into a great part of the land. In very early times Mediterranean seafarers found their way through the Straits of Gibraltar and landed on the south-western and north-western shores of France. Later, the westward drive of Nordic tribes influenced settlements on the northern shores of France in two ways. The first was indirect, when the Anglo-Saxon invaders of Britain forced out from Cornwall Celtic-speaking peoples of Alpine descent, who crossed the western waters of the English Channel and occupied the north-western part of France ; hence came the physical traits of the people, the Celtic language and even the name of the peninsula of Brittany. The second influence from northern Europe was that of Normans who landed on the eastern part of the Channel area of France and gave the name to Normandy.

All these immigrants have contributed to the growth of modern France, which by the latter part of the 17th century and in the 18th century had obtained a leading position in

Europe. By this time the State had gained its present extent except for modifications on the eastern borders; its monarchs had firmly established their power, built palaces and held court in the capital whence radiating roads were made to all parts of the realm and to the great castles of the nobility. These secular buildings and the splendid cathedrals of the Catholic Church remain as monuments of architectural developments, while learning and literature advanced under the patronage of the leading men of Church and State. France had great power also overseas, and colonial possessions were obtained in what is now French-speaking North America and in south Asia.

Yet the poverty and oppression of the great majority of the people, who were peasants working on the land, was one of the chief factors which brought about the French Revolution at the end of the 18th century; from that movement resulted the internal conflicts and external wars which marked the beginning of the 19th century. Under Napoleon, France made conquests and exercised political influence over much of Europe, but in 1815 her power was limited to her own borders, although her earlier incorporation of Corsica was confirmed. Later, came further internal political conflicts from which emerged the present constitution of France as a Republic, the power being now vested in an elected President and a Parliament consisting of the National Assembly and the Council of the Republic. There was also decreed the separation of the State from the Roman Church, although most of the people who profess any form of religion still adhere to the Catholic faith.

During the 19th century there was a gradual development of industries, though these never dominated economic and social life in France to the same extent as they did in the United Kingdom and in Germany. Manufacturing and commerce meant the rise of a middle class between the nobility and the peasantry, and the growth of the urban population as compared with that of the country. Yet in France there are now only five cities with over a quarter of a million inhabitants; in the United Kingdom there are 15, and in Germany about 20, such large towns. The growth of commerce in the latter part of the century was one of the causes of a wide acquisition of overseas territories in each of these three States; France extended her possessions in South-east Asia and gained large areas in North Africa.

The First World War brought the devastation of large areas

in the eastern part of the country and a great loss of life of Frenchmen of all regions. On the other hand, there were the political and economic gains in Alsace-Lorraine referred to above, while the French African territories were increased by mandates over areas taken from Germany. In the Second World War actual fighting again meant loss of men and devastation of lands and goods ; also the occupation by German troops disrupted economic life ; further, half a million of the young men who were taken to work in Germany never returned.

Overseas, post-war changes occurred in South-east Asia where risings in Indo-China compelled the granting of more freedom to the inhabitants, and this change was bound up with a general political reorganization of all the French lands at home and abroad. There is now a " French Union," with a definite constitution, embracing (i) " Metropolitan France " on the continent and including Corsica ; (ii) Algeria, and other overseas departments and territories mainly in or adjoining Africa ; (iii) French Associated States : Indo-China and the Protectorates of Morocco and Tunisia.

The worst destruction of ports and communications which took place in the latter part of the Second World War was fairly soon made good ; foreign trade was resumed, though with the financial handicaps common to most of Western Europe.

Industries have been aided by the Government by the completion and extension of great schemes for water-power plants, as the coal deposits of France are by no means adequate.

In the valleys of the Rhône system great installations are erected or planned ; among them, those of the Isère and its tributaries are already numerous and will be increased and developed into one vast connected system. The Rhône itself has two series of works, placed where the river has cut narrow valleys into rock which gives firm foundations for dams to hold back the water for diversion into the power-stations. The first is at Génissiat, about 30 miles below Geneva, where the river impinges upon the marginal rock structure of the Jura Mountains ; the second is at Donzère (near Montélimar) in the lower Rhône valley where this narrows by the Coiron massif and where the Mediterranean region begins.

Both sets of the Rhône works are linked with improvements in the navigability of the river. Rocky defiles with swift currents are being circumvented by canals, and the depth of

the water is to be regulated by the dams and sluices necessary for the power-plants. Minor works will be constructed at a number of other points, and the completion of the system to make the Rhône navigable as far as Geneva has been planned to take twenty years. A further advantage of the power schemes will be utilization of the water below the stations for irrigation; this has already been begun in the Camargue and will be continued in the Provence area farther north near Orange. Other irrigation systems of the same kind will be constructed in the Mediterranean coastal area both west of the Rhône delta with water from works in the Central Plateau and also east of Marseilles with water supplied from stations in the Maritime Alps.

A final step in the development will be the construction of one electric grid for all the south-east of France, carrying power from snow- and rain-water plants which have different seasonal maxima, and also from coal.

Agriculture was not seriously damaged by the war, but it was realized to be in great need of improvement. France is still to a large extent a land of farmers, and the prosperity of the whole State is closely bound up with their productivity, the average of which is lower than that of other western countries.

This relative lack of efficiency is connected with the small size of the farms; most are worked by their owners and their families, employing very few, if any, hired labourers. The area of land each farmer cultivates is small and frequently divided into strips alternating with those of the neighbours, one cause for this being the old legal system of sharing the land among the sons of a farmer at his death. The small and divided holdings hinder the mechanizing of farmwork, and the Government's post-war attempts, e.g. by supplying tractors, met with great difficulties. Another factor to be taken into account is a general and harmful clinging to tradition. The farmers and their families have the virtues of hard work and thrift, but they show their conservative and individualist habits of mind by tending to live on what they themselves produce. This enables them to live frugally, and often better than the townsmen; on the other hand, it creates difficulties in the supply of food to the industrial population and has embarrassed the Government in its post-war reorganization.

In general, there is in France a cleavage of interests between

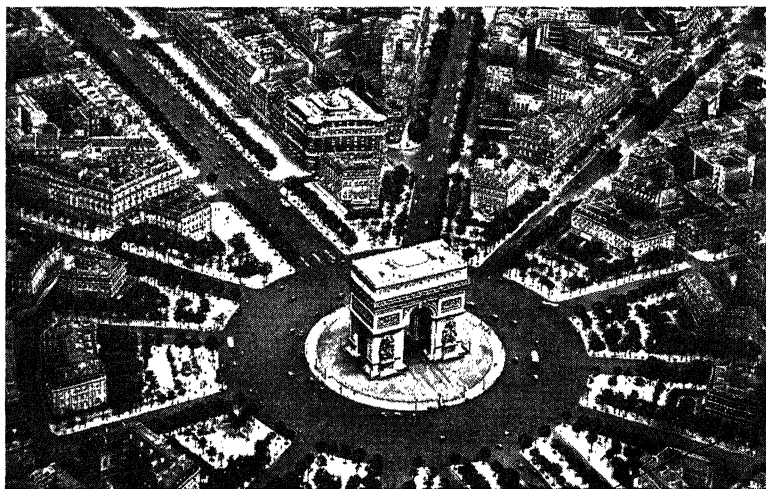
the workers on the land and those in the cities, as is also the case in a number of European States. Other cleavages within the State also show themselves, e.g. between importers and home producers of manufactured goods, and between those who desire control of education to be in the hands of Church or State respectively. These divisions influence the elections to the National Assembly and the Council of the Republic, and the resulting political conflicts have weakened the power of successive governments to effect changes. However, France has now become one of the States which have taken over important economic functions, such as transport by rail, coal mining and the supply of gas and electricity.

The area of France is greater than that of any other State of Europe, except the U.S.S.R.; it covers about 213,000 sq. miles. But its population, which is about 41 millions, is much smaller than that of Germany and smaller even than that of Italy. The average density of population is 190 to the square mile.

It is realized in France that there is a "population problem," viz. that the State is under-populated, in the correct sense of the phrase, for an addition to the population would increase the productivity of the nation and raise the average standard of living. This standard is about the same as that of the other States of the north-western part of the continent, but it could be raised both by improvements in economic methods and by additional workers. When the post-war reconstructions were officially planned, it was estimated that the introduction of $1\frac{1}{2}$ million workers from abroad would be necessary; these, however, were by no means obtained, though a considerable number came from the over-populated North African territories and small numbers from Italy. Before the Second World War, labourers had been attracted from abroad, notably from Italy, Spain and Poland, but against this increase must be offset the losses due to warfare and the German occupation.

The essential factor in the shortage of man-power in France has been the long-continuing low birth rate. This began to decline as early as the beginning of the 19th century; since then it has varied, but the reproduction rate appears to have remained below replacement level. Unless a post-war increase in the number of births continues for a long period, France must face a drop in the number of its population. •

In the quality of its people, however, the State stands high. The French nation has been described as the most civilized in the world. Foreign observers agree on the fine appearance of Paris and many other cities ; the public buildings prove the ability of those who planned them and of the craftsmen who erected and decorated them. Other visitors value the exhibi-



[Aerofilms

FIG. 77.—VIEW OF A CIVIC "LAY-OUT" IN PARIS.

Note.—The "Place de l'Etoile" has been formed where about a dozen converging tree-lined "Avenues" intersect the great thoroughfare which crosses Paris, with scarcely a bend, from east to west just north of the Seine by the "Palais du Louvre." In the centre of the Place is the "Arc de Triomphe," constructed to commemorate a Napoleonic victory of 1806.

tions of art and science in museums ; it is also pointed out that general intelligence is noticeable at all social levels : " Civilization goes far lower down in France than elsewhere." High standards are a common feature of French life, seen for instance in the thorough system of education, where precision of language is a primary requirement. Precision of thought, also, is to be seen in the logical methods adopted in many business and political affairs.

CHAPTER XX

MARITIME MARGINS: (C) SOUTHERN EUROPE

IN this group are the four States of Europe which extend in peninsular form so far South that they, or at least the larger parts of them, lie in the belt of "Mediterranean" climate. Hence their resources are to a considerable extent different from those on which the States farther north are mainly dependent; moreover, they are almost shut off from the mainland areas of the continent by highland barriers. Three of these southern States (Spain, Italy and Greece) have extensive coasts washed by the Mediterranean Sea, in which they have also island territories, and throughout their history they have been bound up with the lands, peoples and cultures of the Mediterranean region as a whole. Portugal, too, although it does not have a Mediterranean coastline, is and has been influenced in its development by climate and people of the Mediterranean type.

In this chapter it is convenient also to consider four Mediterranean outposts of States which themselves lie outside the scope of this volume. Three are British territories: Gibraltar at the western end of the Sea; the Maltese islands in the centre; Cyprus at the eastern end. There is also the European remnant of Turkish power situated by the waterway connecting the Black and Mediterranean Seas.

Iberian Peninsula.—The origins of Spain and Portugal are so closely bound up with each other that it is easiest to consider the influence which has been exerted by the Iberian Peninsula upon both these States before considering the later and present conditions of each.

The movements of peoples who have entered and settled in the Peninsula have been largely determined by two dominant features: (i) its separation from the European mainland by the high and broad mass of the Pyrenees; (ii) the fact that its coasts are reached at least as easily from Africa as from Europe. As a result, although its population has been derived from the same racial groups as those of the central and western parts

of Europe, the migrations or intrusions from Africa have had much more important results than in the States studied in the preceding chapters.

In prehistoric times, African migrants of the Mediterranean racial group introduced successive developments in various ways of life. Later, a few centuries B.C., there came from France people of the Alpine group, known as Iberians, from whom the peninsula took its name.

About the beginning of the Christian era traders from Carthage formed colonies in the south, and the Romans made conquests and brought their language and civilization to large parts of the region. Soon afterwards, Nordic invaders came to the northern coasts and reached even the far south, though not in large numbers. In the 8th century A.D., when the Peninsula had become largely Romanized, the Moors from north-west Africa entered as Muslim conquerors and modified both the racial and cultural characteristics of a considerable part of the population. At one time only small Christian States maintained themselves in the northern highlands, whence slow reconquests took place. From Galicia one southward movement led to the formation of Portugal, while from the Cantabrian mountains other movements resulted in the creation of a united Kingdom of Spain and the final expulsion of the Moors at the end of the 15th century.

Spain.—Spain is a land of striking contrasts which have greatly influenced the history and the present-day characteristics of its peoples. These contrasts are due in the main to its complicated structure and to its overlap of two climate regions.

The northern line of highlands includes the fold-mountains of the Pyrenees in the east, and the Cantabrians in the centre, while in the west is the irregular mass of Galicia. At the Mediterranean end of the Pyrenees is the country of the Catalans which stretches down the coast from France through the province of Catalonia; this has its own language and literature, its tradition of distinct nationality, its typical enterprise resulting in unusual industrial development, and an opposition and sometimes an active enmity against central Spain. At the Atlantic end of the Pyrenees are the Basque provinces to which one may apply the same general description showing its contrasts with the remaining regions of Spain; the industries of the Basque provinces are based on the mineral deposits of its

mountains. Galicia, too, stands aloof ; in its spoken language and its early history it is related more closely to Portugal.

South of the Cantabrians lie the two basins of Old and New Castile, the heart of Spain. The union of this region with that of Aragon beyond the Iberian Highlands was the basis of the power of the Kingdom of Spain, and from the Castilians have been derived the dominant characteristics of the Spanish people. The hard life of the semi-arid plateaus has fostered a tradition of austerity and dourness, of personal pride and dignity, and of an uncompromising devotion to the religion of the Catholic Church. Political and military power and its central position has enabled Castile to subjugate all Spain, and from Madrid the railways and roads reach out in every direction to assist government as well as commerce.

South of the Sierra Morena is Andalusia, a very different land. Except on the heights, it has a climate with much warmth and sunshine and, especially where rivers from the mountains give water, has possibilities of good living. In this region, the Moors ruled for the longest time and left enduring memorials of their culture, as in architecture, the construction of irrigation systems, a tradition of music, dancing and other customs and manners of living.

The Mediterranean coastlands of the south and east, in Malaga, Murcia and Valencia are fertile, and comparatively prosperous where the natural conditions have been utilized for the common good of the population ; like the other peripheral regions, they contrast in their human geography with the interior.

It has been the central Government which has mainly determined the changing course of the story of the State as a whole. In the 16th and 17th centuries the rule extended not only over Spain itself, which then had its greatest development of literature and learning, but also over other parts of Western Europe and much of the Americas which were discovered and conquered largely by Spanish agencies. But in the 18th century the ruling dynasty changed and Spanish power diminished, until the Peninsula was invaded by Napoleon, and this disaster paved the way to the revolt of the colonies of Central and South America.

The 19th century saw internal dissensions and conflicts, and Spain lost practically all its overseas possessions. At home, the country had neither the leadership nor the resources to

share in the development of industries and trade which characterized other States of the continent. In the present century there have been regional revolts, e.g. that of a "Catalan Republic," against the central power, as well as the uprisings of extreme and mutually conflicting parties such as Anarchists and Communists. Even anti-clerical movements appeared, though the Catholic Church has kept the allegiance of the great majority of the Spaniards. Although the State managed to keep out of the First World War, the internal disputes, including the struggles between Republicans and Monarchists, led to the Civil War of 1936-39. After this most disastrous period, involving the loss of over a million lives, the State maintained neutrality again during the Second World War. Indeed, in one respect it gained, for it was then able to sell abroad its metals and other war materials at high rates.

A "Nationalist" and anti-Communist government was set up at the close of the Civil War, and a series of laws instituted a new form of government. The supreme organ of the State is the "Spanish Cortes"; it has a complicated constitution unlike that of the Parliaments of Western Europe, for it represents numerous groups of people as such, e.g. government officials, military officers, certain professions and industries. Further, although there is at present no King, Spain is declared a monarchy with a council of regents at the head of whom is the "Caudillo [i.e. Leader] of the Empire, Chief of the State, Commander-in-Chief of the Armed Forces, Prime Minister and Head of the Falange Party." The selection of a monarch rested with the regency council, but the Caudillo has not agreed on terms upon which he will accept the successor to the throne, now in exile.

The Falange Party was one of the organizations which fought against the Communist Government in the Civil War. When the latter was defeated, the Falange became the one political party which the Nationalists permitted in the State; no organized "opposition party" (as in Britain) is tolerated by the Government and no choice of policies is open to the citizens. The Falange is in charge of the social and welfare enterprises allowed by the authorities, and to obtain employment a worker must belong to it; membership of the party, and at least nominal support of the Government, is therefore fairly universal.

No criticism of the Government is possible under the parliamentary system, and the Press is not permitted to publish

anything as news or views which the authorities do not approve. As the public has no means of criticizing or complaining, there is no effective check upon government officials ; it is accepted by everyone that corruption and injustice are common but inevitable.

The fact that the Caudillo is also Commander-in-Chief of the Armed Forces is an important element in the Constitution, for the State is not at war with any other Power and the recognized function of the armed forces, with that of the police, is to keep order at home ; on this function about half of the Government's total budget is expended. Moreover, the political influence of the army is the greatest factor in the State, under that of the Caudillo himself. But it is not only to check the complaints of individuals or of small groups of people for which the armed forces are needed ; there is national discontent in the provinces, particularly that of the Basques and Catalans.

It is in these regions that industrial developments have been greatest, apart from particular instances in the larger cities. The general economy of Spain is hindered by the natural difficulties of transport, but these have been added to by legislation such as that which has raised Customs barriers between the provinces and around the large towns. Even more disastrous is the worn-out condition of the railways, for this hampers or prevents the normal exchange of goods and also the improvements so badly needed both in manufacturing and in agriculture.

With the undeveloped state of the Spanish industries, there is not in the country itself the necessary materials for such things as replacement of factory equipment, the erection of power-stations, and supply of tractors and fertilizers for efficient agriculture. These requirements can be met only by purchase from abroad, and the necessary credits and loans depend upon the goodwill of industrial countries towards the Government. Hence the generally poor international relationships between these States and Spain has been a serious problem for years.

In this situation a factor intervened during 1950 and 1951 which had already become important in other parts of Europe. The U.S.A. had come to fear aggression by the Soviet Union whose Communist political and economic policies were at the opposite pole from her own type of democracy and free enterprise. Hence, in order to combat the spread of Communism

in countries where standards of living were so low that dissatisfaction or despair might aid conversion to Soviet ideas, the United States had for some years past granted assistance for the most urgent needs of Governments which thought similarly about the Soviet Union. Also, more recently, the U.S.A. had sought to combine with these States in making military plans for defence against attack. Further information on this latter development will be given in the final chapter, but here it must be recorded that during these two years, 1950 and 1951, the U.S.A. worked to bring Spain into the system of mutual aid. In return for certain military advantages it renewed the diplomatic relations with Spain which had been broken a few years earlier, and it granted very large credits for specific forms of economic assistance which may increase the production of goods for the Spanish people.

The condition of agriculture is of the utmost importance in Spain, particularly in the semi-arid regions. Its low productivity is due partly to nature, and partly to the human factor. To mitigate both the normal lack of rain and the occasional droughts, irrigation is the prime necessity. This is to some extent in existence (see Fig. 65 on p. 243); other schemes are planned and still more are possible, but they are prevented from being carried out by difficulties mentioned in earlier paragraphs. The highlands of Spain supply great quantities of water, and the problem is to use them both for irrigation and subsequently for hydro-electric power. As the coal resources of the country are relatively small, water-power when utilized could aid the growing industries and make serviceable the out-of-date means of communication.

One very important human factor is the backward state of tradition and knowledge of the workers on the land; e.g. soil erosion has been disastrous, and to redeem it re-afforestation and other methods on a large scale are needed. Another factor is land tenure, particularly the very large holdings of wealthy "absentee landlords." This is perhaps the chief cause of the extreme poverty common in Andalusia; with all nature's gifts, large areas of this province are described as among the poorest to be found in all the western part of Europe.

Considering Spain as a whole and reviewing its physical conditions and the past and present human factors, one is not surprised that for its size the land does not support a notably

large, or prosperous, population. On a territory of 195,000 sq. miles live 29 million people ; hence there is an average density of 141 to the square mile. The average standard of living has for long been lower than in any of the countries discussed above, while in recent years the internal warfare and political conditions of Spain have made the difference more marked. On the other hand, the net reproduction rate of the people is among the highest in Europe, and the population is still increasing relatively rapidly. Hence there is over-population, which shows itself in low rates of wages for the mass of the people, and in widespread lack of work both in the towns and for periods of the year also on the land. The Government has a wide programme of aid including unemployment insurance, assistance to large families and old age pensions ; unfortunately, the schemes are not made effective and the hardships of a considerable part of the Spanish nation are not relieved.

Portugal.—This State has a greater degree of uniformity than Spain, due in part to its smaller extent and in part to its position in the Iberian Peninsula. One notices in the first place, that it comes entirely in the Mediterranean climate region and hence the ways of life of the Portuguese people are everywhere of the same general kind, at least in regard to agriculture—the main resource of the land. Secondly, it does not extend into that part of the Peninsula which has been so dislocated in the geological past; hence there are no regions showing the fundamental contrasts observed among those of Spain. Further, the generally westward tilt of Portugal gives it a greater proportion of lowland, with a coastline which is entirely open to Atlantic influences.

The regions of Portugal are indicated in the map on p. 240 and the description of them in the accompanying text shows to what degree the coastal areas resemble one another, while the higher regions behind do not exhibit such striking differences from the lowlands as are displayed in Spain. Also in Portugal there are not the various natural difficulties which hinder communication between the peoples of its various parts ; indeed, the breaks in the navigability of the larger rivers have had a much greater effect in determining the national boundary between Portugal and Spain.

The Portuguese people were derived in very early times from the same Mediterranean racial stocks as those of the adjoining

parts of Spain, but in the more recent phases of its history some differences between the two nations developed. As already explained, the expulsion of the Moors proceeded independently southward from the Galician area, and the western form of the Latin of the Peninsula which existed there at that time became the dominant speech of all this part of the liberated area ; hence the Portuguese language developed distinct from that of Spain. Also a Kingdom of Portugal was established earlier than that of Spain, and the Moors did not have such a long occupation or leave such marked influences in Portugal, except perhaps in the Algarve region of the extreme south.

In the 15th century Prince Henry, "the Navigator," sent out expeditions to the African coasts, and the rulers of Portugal, favoured by its maritime situation facing the New World, acquired great colonies, including Brazil, various large areas of Africa and portions of India. One consequence was the introduction of Negro slaves, bringing a racial element still discernible in the Portuguese population. Another result was, as in Spain, a temporary acquisition of wealth followed by a period of decline in power and prosperity, and eventually by the loss of part of the overseas trade and possessions. The colonies that remained, though in Africa extensive, were not as profitable as those of France, Belgium or the Netherlands.

In the present century Portugal's remoteness from the mainland of Europe enabled this State, like Spain, to remain neutral during both the First and Second World Wars. Thus it escaped the material losses and the changes of territory which many of the States suffered. In fact, its neutrality, combined with isolation from the scene of warfare and its position on ocean routes, enabled it to draw advantages from the second war: besides the sale of minerals at very high rates, the aerodrome at Lisbon served as a neutral ground where civilians from both sides could come—with profit to Portuguese trade and the hotel industry.

Recent improvements in the utilization of natural resources have been but few ; agriculture still lacks mechanization, though marshes have been drained for rice-growing ; textile mills now produce more cotton goods, and water-power is to be more used. Coal and oil must be obtained from abroad, and other imports include raw cotton for manufacture and colonial products such as sugar and coffee. Exports are of cork, wine and sardines.

The productivity of Portugal as a whole is illustrated by the fact that an area of 35,000 sq. miles supports a population of 9 million persons; this gives an average density of about 206 to the sq. mile which may be compared with that of 141 per sq. mile in the case of Spain. The government of the State during the present century has been marked by many and troublous changes. The Kingdom was brought to an end in 1910 by a revolution, and a republic was proclaimed. Later, in 1933, a plebiscite adopted a constitution providing for an elected President and for a National Assembly to act together with a Chamber elected on a different basis. Before this, the finances of Portugal were already in a bad condition, and the Minister who had restored order to these and other affairs of the State was now made Premier with practically dictatorial powers. But, as in Spain, economic advances have been slow and the standard of living of the majority of the people remains low; poverty is especially marked among the workers on the land. At the same time the birth rate is high, and it keeps the population further above the replacement level than in almost any other country for which statistics exist. With its numbers still growing rapidly, the condition of the Portuguese people can be relieved only by an increase in the industries, a general modernization of the means of production, and by accompanying social developments.

Italy.—When looked at on a map of Europe, Italy might appear to be an almost perfect example of a “natural” political unit, comprising the peninsula stretching southwards into the Mediterranean Sea with the adjacent islands, and also reaching northwards to the Alps which form a natural frontier to the States of the mainland. A more careful scrutiny of the map would show two exceptions: the island of Corsica is French, and Switzerland has a wedge-shaped projection across the Alpine watershed to the “Italian” lakes.

Yet the political unit of Italy is by no means uniform; although its geological structure has not divided it into several contrasting and even conflicting regions such as those of Spain, there is one great contrast, viz. that between the “North” and “South.” This contrast is in part a natural one, due to position and to climate, and in part it expresses itself in the human geography. There is no hard-and-fast boundary, but in general terms, the “North” may be taken as comprising all Italy as

far as the southern limit of the Central Apennines, while the "South" includes the Southern Apennines with the adjoining coastal areas and the islands of Sardinia and Sicily. (Refer back to the map on p. 231 and the accompanying text.)

Southern Italy has been mainly peopled by successive waves of migration from other Mediterranean lands, and its present population shows the characteristic short stature, very dark or black hair and eyes, a dark complexion and a clean-cut nose. Later comers, such as the Greek colonists, have left little physical traces of their occupation. On the contrary, the north of Italy was again and again entered from the mainland, and the coloration, stature and skull form are in general those of the "Alpine" racial type. In Central Italy and in Rome itself the groups mingled.

The power of the Roman Empire drew to this area small numbers of people from all parts of the civilized world, and conversely spread the Latin tongue and the systems of society and government throughout and beyond what is now the Italian State. After the collapse of the Empire in the 5th century A.D. the political unity of Italy was broken; for nearly 1,400 years various parts of the land were either under foreign invaders or subject to local rulers who for a time extended their power until they gave way to others. Particularly significant from the geographical point of view were the mediaeval "merchant princes" of the north, who brought wealth from trade between central Europe and Asia, and founded or developed the cities which still remain treasuries of art and architecture. The only continuous authority was that of the Popes, who had temporal power as the rulers of Rome and the Papal States, as well as spiritual authority over the Western Church; their capital was Rome and their prestige preserved the world-wide importance of the city. It may be said that during this period as a whole, the life and growth of the "North," including Rome, was mainly determined by influences from central and western Europe, while the "South" remained predominantly Mediterranean in character.

It was not until the decade 1860-1870 that the unity of Italy was restored by a gradual coalescence of a number of small States around the Kingdom of Sardinia as a nucleus. Then a new Kingdom of Italy was established, the temporal power of the Popes was abolished, and Rome became the capital of the Italian State.

Before this time the Italian lands had not developed greatly ; their resources were by no means fully utilized and there were only small industries. Most of the people were illiterate workers on the land, and particularly in the south agriculture was backward and poverty was common. But unification and the growth of industries in the north helped advances ; the international importance of the State increased, and Italy obtained Eritrea and Libya as its share in the scramble for North Africa.

In the First World War, Italy suffered great losses in killed and wounded soldiers. By the peace treaties, however, she gained from Austria the wedge of territory south of the Brenner Pass known as the South Tirol in which lived many Italians ; this was formed into the two provinces of Alto Adige and Trentino, although the former had a majority of German-speaking Austrians. Italy also gained from Austria the port of Trieste and adjoining districts at the head of the Adriatic Sea in which there was a mixed population of Italians and Yugoslavs under Austrian rule. In Africa, Italian Somaliland was added to the colonial possessions.

Later, a Fascist Government became in effect a dictatorship ; it invaded and annexed Ethiopia (Abyssinia) and became the partner of Germany in the Second World War. In the latter stages of the fighting Italy was reconquered by the Allies after bitter warfare against German troops had swept over Sicily and up the peninsula of Italy, the reconquest being aided by a " resistance " movement of Italians who were against Fascist-plus-German domination.

Between 1943 and 1945 the economic system of Italy was almost shattered, one of the chief reasons being a sudden and disastrous rise of prices of practically all commodities ; i.e. there was severe " inflation " in which the cost of living went up tenfold. Wages lagged far behind, and there was great unemployment as industries could not be carried on with their costs soaring, raw materials lacking and markets disappearing. Internal disorders broke out and chaos threatened the State.

A new Government was needed to replace that of the Fascists, and in 1946 a Referendum to the people led to the abolition of the Monarchy and the formation of a Republic under an elected President, with a Chamber of Deputies and a Senate. A Peace Treaty followed and Italy had to pay reparations to States which her troops had invaded. She also gave up to France some

small frontier districts, to Greece some Ægean islands previously taken from Turkey, and to Yugoslavia most of the disputed areas of mixed population at the head of the Adriatic. Further, in Africa Italy had already left Ethiopia, and now Libya has been granted independence.

Trieste, however, proved a difficult matter. After the First World War, it and the adjacent Istrian peninsula had passed to Italy, but although the port itself had an Italian majority it was a natural outlet for Yugoslav trade, and also the population of the surrounding region was predominantly Yugoslav. The Peace Treaty of 1947 created a "Free Zone of Trieste" comprising the city and a small area of mixed nationality. The port was to be "free" in the sense that traffic could pass through it without hindrance, and the zone was to be neutral territory. But the terms stated in the treaty were not acceptable either to Yugoslavia or to Italy, and even five years later agreement had not been reached.

The post-war conditions of the State were very difficult. Italy has only recently had experience of a unified and democratic rule, and the government has been an uncertain one, unable to bring about much of the necessary reforms. Indeed, the economic situation has been saved only by aid given by the United States to Italy as to other European States, partly in order to alleviate distress and partly to prevent the spread of Communism.

In the north, the "heavy" metal and engineering industries, which lacked both raw materials and coal, had been assisted before the war by governments which tried to provide work for the increasing population. The demand for armaments increased the activity for a time, but after the war and the inflation even high subsidies could not prevent unemployment on a great scale. Some help has been found in the increased use of water-power, and a considerable number of hydro-electric plants have been erected along the Alpine margins. Yet the problem of the industrial north has not been solved. The district around Rome now uses power from the Tiber and there are plans for similar developments elsewhere in the Apennines.

In the south, the case is even worse. Here the farm-workers, who are twice as numerous as those employed in transport, trade and industry combined, are in desperate straits. There was an immediate post-war reduction of malaria in the marshy

areas, but the main causes of the troubles still remain. One is the system of land tenure ; here as in Andalusia most of the land is owned by " absentee landlords," and it is said that in South Italy 5 per cent. of the owners have 50 per cent. of the land. The second cause is soil erosion, due in the main to neglect and bad working of the farms. Enormous areas are covered with thick, slippery clay—either consisting of relatively late sediments or derived from crystalline rocks by weathering and subsequent tillage ; when rain comes, the clay slides down and fields disappear.

The peasants have tried to avoid starvation by mass risings to get land of their own ; intervention by the Government has been weak and improvement has been very slow. But after any change of ownership may have been brought about, soil-erosion would still have to be dealt with, and this needs direction and finance supplied by the State. Scientific methods must take years to make these lands again fertile, and careful cultivation will always be necessary. There is, however, hope in recent Italian trials of an American discovery that the ploughing of a certain chemical into the soil causes the stiff clay to crumble, and in this state erosion is reduced and tillage is improved.

Sicily also has been in a bad state, but recent regional autonomy has given more help in various ways than that previously obtained from the central Government.

The fundamental problem of the Italian State and its people is over-population. On an area of 117,000 sq. miles live 47 million people, with an average density of population of 400 persons to the square mile. What this figure means may be realized if the statistics for other States as given in the Table of Reference are considered in connection with the natural resources of Italy for maintaining so large a number of people.

Moreover, a high birth rate results in a reproduction rate well above the replacement level and hence in a continuing increase of the population. Earlier, this was offset in part by emigration to the U.S.A., South America and other countries of Europe. At present, however, these outlets are virtually closed ; even the few States of Western Europe (including Great Britain) in which there is a post-war lack of workers in certain industries, have not been able to allow any appreciable immigration and thus have not relieved the congestion in Italy.

The standard of living is necessarily low as compared with

that of most European States. The average earnings of the population are small, taking into account prices of goods, and there is mass unemployment for which no remedy is as yet in sight. The mental capacity of the Italian people, and their willingness to work hard, are without question, but it appears that any substantial amelioration of their condition must come both from within and from without their own borders.

Turkey.—In several respects the Balkan and Iberian Peninsulas are alike. Both are separated only by narrow straits from a neighbouring continent and their history has been closely bound up with the advance and retreat of invaders. In the case of the Balkan Peninsula, it was in the late 14th century that the Turks, who had already established a great Ottoman Empire in South-west Asia, crossed the Dardanelles and began their conquests in South-east Europe. In the 15th century they took Constantinople and the Byzantine Empire fell before them; their territories extended until they were beaten back from the siege of Vienna in the 16th century. After that defeat the tide turned, and from the 17th century their dominions shrank until at the beginning of the 19th century the Greek war of independence liberated the southern part of the peninsula and the islands of the Ægean Sea.

Near the end of that century they retained only a narrow wedge of territory stretching westward from what is now Turkey-in-Europe to the Ionian Sea through the present north of Greece, the south-west corner of Bulgaria, much of the south of Yugoslavia and the whole of Albania. This "wedge" was broken up in 1912 when it was attacked by the States on either side of it: from the south, Greece; from the north-west, Serbia (which later became the nucleus of Yugoslavia); from the north-east, Bulgaria. Greece advanced rapidly and occupied the valuable port of Salonika (now Thessaloniki) and the adjoining coastal area. Serbia and Bulgaria, however, fought between themselves for the country north of Greece, particularly for Macedonia—that most debatable land in the Balkan region; in the end, Serbia gained and Bulgaria lost. Later, after the First World War, Greece obtained from Bulgaria its Ægean coastal strip, and reached eastward to the boundary of the small fragment of the Turkish Empire which remained in Europe.

This area is now little more than a bridgehead of Asiatic Turkey across the Straits and the Sea of Marmara; it is in this con-

nection that the State of Turkey is a factor in the politics of Europe, for Turkey may be called the "guardian of the gate" which allows communications by water between the Black Sea and Soviet Europe on the one side, and on the other side the Mediterranean Sea and Western Europe. It is for this reason that the Atlantic powers, including the United States, are interested in maintaining the independence of Turkey, and the United States has given material aid to the Turkish Government as it has done to the States of Western and Southern Europe.

The outworn Turkish Empire came to an end in 1922, when a revolution changed a mediaeval rule into a modern republic. One cannot in this book give an account of the subsequent changes in a State which is predominantly Asiatic. Yet it must be noted that democracy has replaced personal rule; that Islam is no longer the official religion of the State; that education has greatly improved; that important economic advances have been made. An illustration of this last change may be given, as it directly affects Turkey-in-Europe: electricity which supplies lighting and power to Istanbul comes by cable under the Bosphorus from a plant in Asia Minor using both water from the River Sakaria and coal from mines near the Black Sea coast; the same grid supplies power to Ankara, the present capital.

The Table of Reference gives the population of the European part of Turkey as $1\frac{1}{2}$ millions, living on 9,000 sq. miles; the proportion it bears to the State as a whole may be seen by comparing these figures with those of a total Turkish population of about 20 millions and an area of nearly 200,000 sq. miles.

Greece.—It was the ancient Greeks who laid the foundations of modern European civilization; their literature is still studied as a living contribution to present-day thought, and their architecture and statuary are universally admired as masterpieces of art. (See the opposite illustration.) Who were they, and why was it that their genius shone out in this region? The answer is one that can be paralleled at various other times and places: in broad terms, advances in culture may occur when thought and action are stimulated by the contact of active-minded peoples with others who have already acquired useful systems of knowledge, ways of life and traditions.

In this case, the active-minded peoples were tribes from the European steppe-lands, who were to some extent of Nordic origin or had Nordic leaders; they were physically well-built,

hardy and energetic. They spoke an Aryan language which developed into classical Greek. Successive groups worked their way southward to the region where peninsulas jutted out into the eastern Mediterranean. During a period which was sometime around 1000 B.C. they mingled there with earlier settlers to an extent which in later generations resulted in their becoming a hybrid people of the Mediterranean racial group.



FIG. 78.—VIEW OF THE PARTHENON ABOVE ATHENS.

Note.—This Temple of Athena is situated upon the Acropolis, the rocky platform which overlooks Athens from the north. It was built in the 5th century B.C.; its ruined condition is by no means the work of time alone, for it was bombarded and blown up in a battle between Turks and Venetians in the 15th century A.D., and at the beginning of the 19th century some of the sculptures were removed by Lord Elgin to the British Museum.

These early Greeks came into contact with people who had acquired the ideas of the Egyptian and Cretan civilizations, and their modes of thought and expression in language, art and science. These older systems, however, were becoming effete, and the enterprising northerners did not merely accept them; rather, they inquired into them, made use of them in practical ways, and critically examined the conceptions upon which advances already made had been based.

The geographical factor is clear: contact was here possible by means of small ships which traded from Egypt and Crete

with the dispersed lowlands and islands of the Greek region, while these small settlements did not invite complete conquest as a larger area might have done. Further, the willingness of the newcomers to adapt themselves to the "Mediterranean" methods of cultivation, settlement and trade, gave them a secure and permanent habitation in the region. In the course of centuries the Greeks advanced far beyond their teachers, and their thought and culture spread to neighbouring lands.

Nevertheless, the Greek city-States were overrun and absorbed by the great military powers which arose in Europe and Asia, and their fate was bound up with the Empires of Rome, Byzantium and the Ottoman Turks. Yet the people retained their Greek language, traditions and feeling of nationality, and in the early 19th century the Greeks threw off the Turkish oppression and created the modern State of Greece, with Athens as its capital. Since then they have had a troubled and hazardous time, for their position at the cross-roads between Europe and Asia has involved them in conflicts arising far from Greece itself. This occurred in the First World War, and in its aftermath there was an important adjustment of their territory with that of Turkey, for there was an exchange of large numbers of Greek settlers in the coastal lands of Asia Minor for people of Turkish nationality who still remained in the Greek area on the northern coast of the Ægean Sea. Also, in the Second World War Greece was invaded and occupied, and at its close the cession by Italy of the Dodecanese islands contributed to the unity of the Greek territory. This now comprises the islands and the European shores of the Ægean Sea, together with all the adjoining part of the Balkan Peninsula and the Ionian islands.

Another consequence of this war was the involvement of Greece in the conflict between the Communist and non-Communist States, and a civil war which lasted several years. Necessarily, the economic effects of these repeated struggles were disastrous, and much-needed improvements have been slow. The political situation has also been very difficult and lacking in stability, and in 1944 a plebiscite decided on the return of an exiled King. The Government is now a limited monarchy on a normal Western democratic pattern.

The area of the State is about 51,000 sq. miles and the population numbers about $7\frac{1}{2}$ millions. The average density of population is a little less than 150 to the square mile—not far

from the average of the Balkan region as a whole. The standard of living is also about the same as that of neighbouring States, i.e. considerably lower than in western Europe. Greece is primarily an agricultural country with typically Mediterranean productions; trade is concerned essentially with an export of some of these products, together with certain mineral ores, in exchange for additional foods, fuel and manufactured goods. American aid has helped post-war reconstruction in agriculture and land reclamation, communications, hydro-electric power, etc., and it is hoped that there may be an increase in the varied but quite small industries. Such developments will be necessary if only to maintain the continuing increase of population due to a high birth rate; any improvement in the present social conditions will need both an increased productivity of the people as a whole and an efficient and stable government.

The British Outposts.—The three British territories in the Mediterranean region have been acquired primarily to maintain communications through this Sea and to the Indian Ocean and the Far East. These communications, by ships and aircraft, are regarded as essential both for peace-time commerce and in time of war. The territories are used for fuelling, refitting and repairing ships and planes, and as bases for defence.

The "Rock" and tiny adjoining lowland of Gibraltar was captured from Spain in 1704. It consists of a narrow defensible peninsula extending southwards into the Strait where this has a width of only about a dozen miles; hence the strategic value of Gibraltar is obvious. It is a very small Colony with a civil population of about 20,000 persons, but the possession by the British of this part of the Iberian Peninsula is regarded by Spain as an enduring indignity.

The group of small Maltese islands occupies another strategic position—in the narrow part of the Mediterranean between Sicily and North Africa. Its situation and the good harbour have for centuries attracted successive military Powers, and after the British fleet had assisted the Maltese against a French attack, the islanders of their free will agreed to its annexation to the British Crown in 1814.

Malta is extremely densely populated, for it supports over a quarter of a million people who find their main occupation in work for the British Admiralty. Their language is Maltese, though many also speak Italian. The constitution provides for

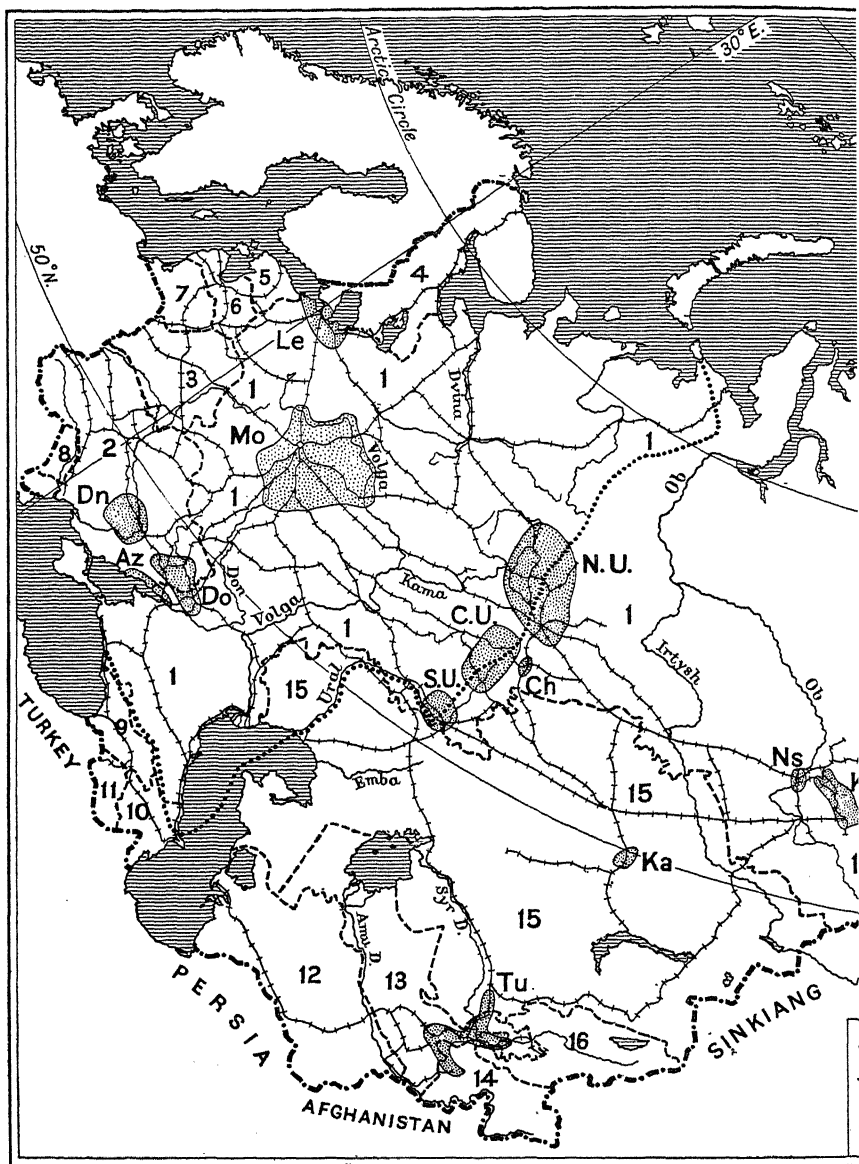
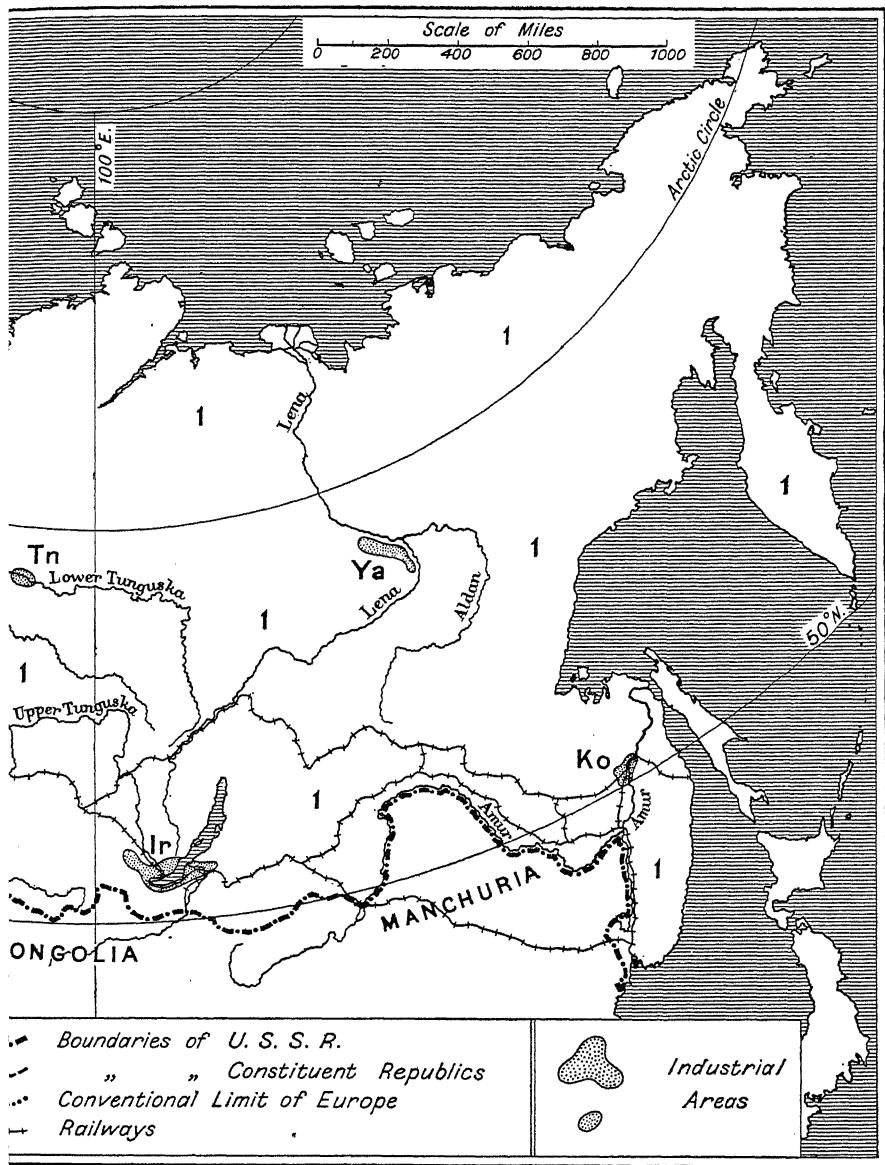


FIG. 79.—THE TER



IES OF THE U.S.S.R.

responsible government with an elected Legislative Assembly, headed by a Prime Minister, which administers all internal affairs ; on the other hand, the British Governor is responsible for defence and external relations. Since the life of the island is inextricably bound up with the defence arrangements and work, harmonious relations between the two authorities are not always easy. The poverty of the people and their dependence upon adequate employment by the Admiralty present difficult problems to the Maltese and British Governments.

Cyprus is situated in the north-eastern corner of the Mediterranean Sea, about 240 miles north of the Suez Canal. It is much larger than the two other Mediterranean territories and although mountainous it is more productive and supports largely by agriculture about half a million people. Because of its position and size it forms a base for land, sea and air forces which may be required for operations in the Middle East. Like Malta it had been occupied by many Powers, and at the end of the 16th century was conquered by the Turks and incorporated in the Ottoman Empire, although the people were mainly Greek by language and nationality. In 1878 Britain acquired from Turkey the right to occupy and administer the island. When Turkey entered the First World War against Britain, Cyprus was annexed to the British Empire. Between the two World Wars it was given the status of a Colony with representatives in the Legislative Council. After the Second World War, proposals for a constitution extending the sphere of self-government were rejected by Greek members of a consultative assembly, and the offer of a constitution was withdrawn.

At present four-fifths of the population are Greek and belong to the Orthodox Church ; of the remainder, most are of Turkish origin and are Muslims. Under the British administration each community has its own system of education and all the people have benefited from aid given in connection with agriculture and forestry ; a notable advance has been accomplished by the draining of the breeding-places of mosquitoes and the consequent elimination of malaria from the island. Yet in spite of acknowledged advantages, most politically minded Greek Cypriots demand " *Enosis*," i.e. union with the Motherland.

CHAPTER XXI

EASTERN (TRUNK) EUROPE — THE U.S.S.R.

A Eurasian State.—The eastern part of the European Continent broadly corresponds to the geographical conception of Trunk Europe ; also, it forms the western part of the Union of Soviet Socialist Republics. There is no definite physical boundary to Europe, nor is there any political division between the European and Asiatic portions of the U.S.S.R.

A conventional limit to the continent runs southward along the crest of the Ural Mountains, next it follows the Ural River, then it takes a course across the Caspian Sea and finally runs westward along the crest of the Caucasus Mountains (see Fig. 79 on pp. 332 and 333). No such limit, however, divides the European part from the rest of the U.S.S.R. in political or administrative arrangements. As political, economic and social matters are inextricably bound up together, one must here consider the nature and policies of the Union as a whole.

The peoples of European Russia were Asiatic in origin ; so, too, was the territory which they occupied and which gradually spread in what is now known as Europe. The first definite State was centred upon Kiev, and in the 13th century Moscow became the capital of its successor, Muscovy. The power of this State extended both west and east over the forest belts and south over the steppe-lands. At the beginning of the 18th century Peter the Great advanced westward, conquered the shores of the Baltic and Black Seas, and did much to "Europeanize" Russia. It was also in the western part of the Russian dominions that the climate allowed the greatest production, and here therefore the greatest growth of population and political power occurred. In recent times, however, the main direction of the movements has been reversed and advances have extended from west to east, especially since the Soviet rule has replaced the Russian Empire. Yet always the State has occupied a central position in the continent of Eurasia.

A clear distinction should be made between "Russia" and

"The U.S.S.R.," for now Russia is but one of the 16 Republics which constitute the Union—though it is, of course, by far the largest and the most powerful. It would be as incorrect to say "Russia" when one thinks of the U.S.S.R. in a political connection, as to say "England" when one refers to the whole of the United Kingdom of Great Britain and Northern Ireland. The table on the next page gives a broad idea of the comparative areas and populations of the 16 "Constituent Republics" of the Union, as far as the facts can be ascertained; it relates to the conditions at the end of 1951.

The situation of the respective Republics is shown in Fig. 79, and may be read with the following key: In Europe are: 1, (part of) the Russian Soviet Federal Socialist Republic; 2, Ukrainian S.S.R.; 3, Byelorussian (White Russian) S.S.R.; 4, Karelo-Finnish S.S.R.; 5, Estonian S.S.R.; 6, Latvian S.S.R.; 7, Lithuanian S.S.R.; 8, Moldavian S.S.R. In Transcaucasia are: 9, Georgian S.S.R.; 10, Azerbaijan S.S.R.; 11, Armenian S.S.R. In Central Asia, known as "Soviet Turkistan," are: 12, Turkmen S.S.R.; 13, Usbek S.S.R.; 14, Tadzhik S.S.R.; 15, Kazakh S.S.R.; 16, Kirghiz S.S.R.

It will be observed that the area of the European portion of the Union occupies somewhat over 2 million out of a total of considerably more than 8 million sq. miles (i.e. less than one-quarter), while its population includes 160 millions out of a total of over 200 millions (i.e. nearly four-fifths). Also, the Russian Republic (the R.S.F.S.R., which includes Siberia) extends across almost all of the more northerly parts of Europe and Asia, occupying about three-quarters of the total area of the Union and comprising more than half the total population.

It may be added that the Republics in the European area with largest populations (after the R.S.F.S.R.) are the Ukraine with about 42 millions and White Russia with about 11 millions. The average density of population in the four groups of Republics may be calculated from the above, and it must be borne in mind that even the European part of the U.S.S.R. has an average density of population of only 76 per square mile—less than any other State of Europe except those in the far north.

Peoples and Economic Growth.—Though no part of the Union can be studied in isolation from the rest, in this book emphasis must be placed upon the European area. The earlier chapters have already given much information about the peoples

Republics	In Europe		In Asia		In whole of U.S.S.R.	
	Area '000 sq. m.	Popn. millions	Area '000 sq. m.	Popn. millions	Area '000 sq. m.	Popn. millions
Russian Soviet Federal Socialist Republic	1,636	98	4,971	20	6,607	118
7 European Republics	464	62	—	—	464	62
3 Trans-Caspian Republics	—	—	83	8	83	8
5 Central Asiatic Republics	—	—	1,554	18	1,554	18
Total of U.S.S.R.	2,100	160	6,608	46	8,708	206

of this part of the State, and here attention may be specially drawn to the facts set out in Chapter V. There, maps and their accompanying text show and explain the racial types and movements (Figs. 22 and 23); the languages spoken in the European part of the Union (Fig. 24 and the back end-paper); the religions of those who profess a particular faith (Fig. 25); the extent of the territory of the U.S.S.R. before and after the First World War (Fig. 26) and the political significance of the changes. The territorial changes due to the Second World War are shown in Fig. 81 on p. 355.

In Chapter XVII were given a map (Fig. 71, p. 272) and a descriptive account of the geographical regions comprised in the European part of the U.S.S.R., setting out their natural resources and their utilization up to the post-war period. Many specific facts are there stated about the developments which have transformed relatively small settlements or scantily populated rural areas into industrial districts with urban communities or even large conurbations. To make such changes clear, an additional map has been prepared (Fig. 80 on pp. 348 and 349) indicating the chief industrial areas and more isolated centres, and the types of production with which they are specially associated. By comparing this map with that showing the European Constituent Republics, the relative economic and

political importance of these Republics may be estimated. In this connection the map of the distribution of population in Europe, facing p. 1, should also be studied.

During the past few decades two factors have stimulated economic developments in the Asiatic area : its mineral wealth and the wars in Europe. It has enormous resources of coal, oil, iron and a wide range of non-ferrous minerals whose utilization is scarcely begun. An unprecedented drive to make immediate use of these was due to the Second World War when the European mining and industrial areas were first threatened, and then in part actually overrun, by German armies. Hence much mining and other equipment and many hundreds of factories were transferred to the safer areas of the Urals and Asia.

Here, both during and after the war, there occurred great developments in the coalfields, viz. in the huge "Kuzbas" (in the Kusnetsk area of the Ob River basin), the neighbouring field near Novosibirsk, the Karaganda field in the Kazakh Republic, that of central Siberia near Irkutsk, and that of the Far East around Komsomolsk. Also, a beginning has been made to utilize the very widespread deposits near the Arctic Circle in the basin of the Tunguska River, and in the Yakutsk district of the Lena River. (All these areas are indicated in Fig. 79 and may be identified by the abbreviations of the names.) As iron ore is found in or near most of these fields and as other minerals are even more widely distributed, there have already grown up industrial areas which are mainly devoted to productions of the "heavy industry" type, e.g. rolled steel and machinery, and the larger kinds of equipment for agricultural, transport and war purposes. By the middle of this century the output of coal and steel in the Urals and farther east, taken as a whole, had caught up with that of the older U.S.S.R. European industrial areas. By 1951, too, the production of the U.S.S.R. in coal, in iron ore and in steel was considerably greater than that of any other State except the U.S.A.

These developments have required two other changes : the improvement of means of communication, and the provision of labour. In these respects the Asiatic territories were very badly supplied. The railways of European Russia formed a network which, though not so closely intermeshed as those of Central and Western Europe, was in marked contrast with the few lines penetrating Asia, only one of which reached the Pacific.

In the past few years these lines have been increased in number, length and capacity, and are being further developed.

Adequate labour could not be obtained from the native peoples of Asia, who were few in number and without skill or liking for the kind of work required. Migrations from Europe, free or forced, had to be organized; during about 15 years before the Second World War some 2 million people went to the Turkistan area of Central Asia (see Fig. 79) where irrigation from the Amu and Syr rivers gave rise to the production and manufacture of cotton and other semi-tropical crops. Also, more than 3 millions went to Siberia from the European area, either as willing or unwilling workers in mines and industries, or as deported agricultural workers who had opposed collectivization of their farms. During and after the war a large number of people, perhaps about 2 millions, were sent to Asia for political reasons, and these were used in the eastern drive towards industrialization, in addition to voluntary technicians whose services were needed and paid for at high rates. All these transfers of labour contributed to the rapid growth of many new towns in Soviet Asia.

The Government of the U.S.S.R.—A study of the economic and social conditions of any part of the Union must take account of the nature of the government and the policies of its rulers. Within the Union are a number of different peoples who exhibit extreme contrasts in their traditional modes of life and have distinct communal or nationalist feelings. In former times Russian imperialists, first in Europe and later in Asia, forcibly made alien peoples change many of their ways of living and give up their local organizations.

When Soviet rule followed the same general pattern, it did so with an important modification. It planned a form of government which allowed to the various peoples "home rule" in a number of ways, especially in cultural matters, although all the Republics are brought within the same system of centralized government. There is one constitution for the whole of the Union, and to this every part is subject. In many parts of the world, however, a "paper constitution" may be a matter of theory, while it is negatived by actual practice. In the case of the U.S.S.R. it appears that all the 16 Constituent Republics have a legal right to enter into relations with foreign States, to conclude treaties with them, and even to withdraw altogether

from the Union. Nevertheless it is difficult to think that this right could be freely exercised.

Within the 16 Constituent Republics there are smaller units of the Soviet government, e.g. "Autonomous Republics," "autonomous regions" and "national areas." These represent national or tribal communities and have certain powers of local rule. Also, the Autonomous Republics, like the 16 Constituent Republics within which they are included, have their own Supreme Councils and their own Ministers who are responsible for departments in the administration of the territories concerned.

The central organ of government of the U.S.S.R., whose seat is the Kremlin in Moscow, is the Supreme Soviet consisting of two chambers together responsible for law-making. These bodies are : (i) "The Soviet of the Union" which, like the British House of Commons, is composed of representatives for geographical divisions—in the U.S.S.R. each division having 300,000 voters ; (ii) "The Soviet of Nationalities," whose members come from their respective Constituent Republics, Autonomous Republics, autonomous regions and national areas, in order to ensure that the various national and tribal groups of the population are represented. The highest body of those sitting at Moscow, and by far the most important, is that which determines general policies and administers the laws : it is the All-Union Council of Ministers, and its Chairman is the Head of the State.

The members of soviets of every type are elected by voters who include all men and women over the age of 18 ; the balloting is secret. But an important feature, which makes the elections different from those common in Western Europe, is that only one list of candidates for each soviet is selected and at the election each voter has to mark his paper simply for or against the list as a whole ; moreover, there is no opposition party to object to the list. In the soviets themselves also there is no opposition party ; there are discussions of detail and criticisms of the way in which the laws are acted upon, but when a decision has been made regarding a law or regulation it is adopted unanimously.

The Soviets and "The Communist Party."—At all levels, soviets of one kind or another are responsible for carrying out the decisions of the Government, and because the State controls all forms of economic and social activity there are almost innumerable soviets. Each separate branch of activity

has its own set of soviets, working at different levels in a hierarchy going upwards from those of lower rank, which deal with small local units of production, to those concerned with general matters and wide areas. For example, there are soviets which represent the workers in one particular factory or on one collective farm, and discuss the details of its work. But the factory, or the farm, is controlled by a manager appointed by a higher authority in the industry which dictates to him the general method of work and the amount of production required. This amount is determined by a complicated system balancing the needs of the State as a whole against the productive capacities of the districts, areas and regions. Estimates are sent upwards and downwards to the various levels of the industry until a broad agreement on the "targets" is reached by the highest authority. Then orders for production are sent to the main regions, and the necessary amounts are distributed among the smaller areas, and so on till they reach the individual units. Thus the soviets of all the lower stages of a productive industry have but limited powers; the same is true of the soviets of all other branches of the economic and social organization together affecting the lives of the citizens in every way.

In the U.S.S.R., moreover, there is another organization by which the Government can make its will known to the mass of the people and can ensure that its policy is carried out effectively, viz. the Communist Party. The Party, as it is shortly called, is made up of volunteers recruited from young men and women who are trained over a period of years, and are subject to periodic tests both of their devotion to Soviet ideas and of their capability in promoting them.

These enthusiastic Party members are entrusted with responsibility for seeing that the Government's instructions are carried out and that any dissent or opposition is repressed. In all parts of the Union and in all branches of life they constitute small groups, "cells," which are active among the workers. These groups correspond in their arrangement to the various soviets, and in the soviets themselves the Party members form an important and active element. Thus the Party has its own organization within, and also parallel to, that of the soviets; it leads upwards through all levels and at its head is the "Politbureau" which works in the closest association with the All-Union Council of Ministers and its Chairman.

Broadly speaking, the highest-ranking Party members are in fact the most responsible and powerful Ministers in the Government. Thus the Party as such, which numbers about three per cent. of the population, is an important factor in the State.

Another agency to ensure obedience to the will of the Government is the Secret Police, under the control of one of the Ministers, and working in close association with the Party. It operates in every sphere of the work of the State—political, economic and social—and by its nature influences not only actions but even expression of opinions of the citizens of the U.S.S.R.

The Communist Conception of Socialism.—The Soviet constitution states : “ *The economic foundation of the U.S.S.R. is . . . the socialist ownership of the means of production firmly established as a result of the liquidation of the capitalist system of economy . . . and the abolition of the exploitation of man by man.*” Hence, lands, forests, minerals, mines, railways, factories and other material means of production are the property of the State. Peasants on collective farms have a constitutional right only to use the land in common, though they may own their implements and a share of the produce. The constitution specifically lays down that all citizens have a right to “ *their personal property in their income from work and in savings.*”

It is also stated : “ *In the U.S.S.R. work is the obligation and a matter of honour of every able-bodied citizen, in accordance with the principle : ‘ He who does not work, neither shall he eat.’ In the U.S.S.R. the principle of socialism is realized : ‘ From each according to his ability, to each according to the work performed.’*” The remuneration for any particular type or amount of work is settled by a very complicated system, and in practice there are great differences in incomes and standards of living.

✓ However, the material conditions of the great mass of the people are undoubtedly far better than in Tsarist Russia before the revolution of 1917. The new order which was then established brought about within a score of years advances comparable with those achieved in Western Europe only after many decades and even centuries of political, economic and social conflicts and developments. By such changes, both in the East and in the West, the human geography of the areas has been transformed—though at different rates and by different methods.

Some Recent Developments.—Because of the political system it was possible to bring about vast changes in the U.S.S.R.

in a very short time, by the most thorough means and on the largest scale. Successive 5-year plans have been drawn up not only to direct particular economic undertakings but to ensure that all the branches of production and all the needs of consumers are considered in relation to one another. For example, operations planned for industry throughout the Union are linked to one another and at the same time organized in connection with schemes for agriculture and with the conditions of foreign trade and the relations with other States. In the following sections, however, one can describe only the main developments, referring especially to agriculture as the fundamental basis of life in the Union.

Although the U.S.S.R. produces more breadstuffs in the form of wheat, rye and barley than any other State, the feeding of its large population is a matter of great concern to the Government. Before the 1917 revolution, four-fifths of the people worked at agriculture. Much of the land belonged to great land-owners who settled what should be grown and who sold away as much of the produce as possible, including great quantities which went abroad. Of the remaining land much belonged, not to individuals, but to village communities who shared it out in patches to be worked by the members and their families for their own use for a few years before a new distribution. This plan was bad for agriculture: the soil was allowed to deteriorate, the farming was crude and the yield was small. In bad times the peasants, whether under this system or as labourers on the estates of the nobility, suffered actual hunger, and in Russia as throughout Eastern and Central Eastern Europe they had "land hunger," an urgent yearning for land of their own. The peasantry expected that the Communist doctrine would allow their land hunger to be appeased immediately the rich owners were expropriated, but the Communist Government had to consider another matter—the production of enough food for town and country alike. As industries developed, labour had to be taken from the country to the towns and there fed; also, additional raw materials had to be supplied. At present, only half the population is agricultural and it has to satisfy the food and industrial requirements of the other half.

Therefore a simple division of the land into many millions of small farms worked by the former peasants and their families—generally with primitive methods and implements—was quite

inadequate. Hence various attempts were made to establish large and more efficient collective farms. The most common arrangement in the new system was for a group of peasants to have an area allotted to them. On this they cultivated crops and kept animals to yield such production as was laid down by the agricultural authorities; also they had to work by prescribed methods. The State bought at fixed rates what it needed, and the remainder was divided among the individual members of the farms according to the nature and amount of the work they had performed. In addition, they had very small holdings which could be worked individually and the produce used or sold as they liked.

Yet many difficulties appeared. Especially widespread was the reluctance of the peasants to give up ownership of what they considered their own land, and also the ways of living which had been traditional for generations; they also resented having to send away food when they were not able to get equivalent goods from the towns. To overcome their reluctance, which sometimes approached revolt, large numbers of peasants, notably those who were better-off and most strongly opposed to the new system, were deported to Siberia. Another difficulty was the sheer inability of the peasants to grow the kinds and the amounts of the particular products which the Government, and the nation, required. This led to the enforcement of drastic changes in methods, particularly in regard to mechanization of the farms. Tractors for working the land and combines for harvesting were provided, and their use was organized by Government agencies. Incidentally, it may be noted that these machines needed great quantities of fuel, and thus considerably influenced the development of oil production and transport.

The increase in textile manufacturing required the production of fibres in what had been relatively undeveloped regions. For example, the U.S.S.R. is now second in the world to the U.S.A. in cotton growing because of the newly irrigated fields in the valleys of Turkistan and the southern steppe-lands of the European area. The latter region has also brought the Union into the second rank of the silk-producing States.

After the development of the "collectives" came the Second World War bringing the invasion and devastation of the most important farming areas of the U.S.S.R. in Europe, and it brought also other serious setbacks to the Government's agri-

cultural efforts and schemes. Hence these have been extended by wider and more fundamental plans, and in 1948 and 1950 were decreed projects the whole of which cannot be completed until 1967. One important set concerns the collective farms: many are to be merged into larger ones, sometimes including or replacing several of the old village units. With the other agricultural innovations noted below, these developments demand a further break-up of traditions and modes of life among farming families and village communities and some will involve compulsory shiftings of population on a large scale.

Another part of these so-called 15-year plans related to irrigation. There is to be a "basic" reconstruction of the small channels, those distributing water to particular farms or areas, in 11 of the 16 Constituent Republics. Also, great power-stations are to be constructed to pump water from rivers both to the older agricultural lands and also to new areas of cultivation. Two of these plants are on the Volga: at Kiubyshev, where dams will form a lake 300 miles long and 24 miles broad, and at Stalingrad, to irrigate arid or semi-arid lands of the lower Volga basin and the Caspian Lowlands. On the lower Dnieper, additional dams and reservoirs, together with the new Kakhova hydro-electric power-station and another at Tsimlyansk on the Don (see Fig. 80), will distribute water to large areas in the Ukraine and North Crimean Steppes. In the Turkmen Republic a canal, 700 miles long, is to lead water from the River Amu to Krasnovodsk on the Caspian Sea; this is intended, en route, to serve for the formation of additional cotton-lands and also for pasture in the Kara' Kum desert.

Further, the new farming areas in arid or semi-arid European and Asiatic regions are to be protected from wind-blown sand by tree-belts totalling some 3,300 miles. The completion of all these projects will bring about veritable changes in the landscape.

It is to be noted that the above irrigation projects are to be closely linked with developments in other branches of the Soviet economy. The actual construction is to be in connection with the reorganization of the collectives and carried out, as far as possible, by the farm-workers. Moreover, the improvements in the channels of the rivers, with the new canals, will provide better transport of goods and aid communications in general. Over large areas farm work is to be carried on by electricity in place of petrol-driven machinery; this change will also fit in

better with the amount and the distribution of available sources of power.

The forward-looking policy in agriculture is matched by that in all aspects of the Soviet economy. There is a common slogan: "Capital goods first," to which the implied counterpart is "Consumer goods later." The result is a compulsory saving for the future on the part of the great majority of the population. It also affects the comparative advance of particular types of industry—a matter essential in a study of economic geography.

Another policy is the aim of producing the basic national requirements in those parts of the Union least liable to attack in time of war. This was referred to in the earlier section of this chapter in connection with the great developments in the mining and working of coal and iron ore in the Asiatic territories during and after the Second World War. A shift of the same kind is shown in regard to other materials essential both in peace and war, e.g. in the production of oil the "Second Baku" in the neighbourhood of the Urals has already rivalled the original Baku area of the Caucasus; there are still later developments of the industry east of the Caspian Sea and in Soviet Turkistan. Another instance of State-wide planning is the supply of electricity obtained from a variety of sources, including water-power and coal in the first place, and in smaller degree lignite, wood and peat; the whole system is closely interrelated not only in its supply but also in the priority of distribution to places and industries where it is regarded as most needed.

Means of communication have needed improvement as other developments appear; although this has been most strikingly shown in Asia, it is true also for the European area. The railways have been extended, and also supplemented by motor roads reaching out from the main lines, especially into the newer areas of production and settlement. Moreover, where the relief of the land is marked, or the climate presents difficulties, air transport has been utilized, and the construction of many air-fields has been necessary. In Europe navigable rivers and canals play a greater part than in the Asiatic area. A complete network of waterways now joins the rivers which flow to the four seas—Baltic, White, Black and Caspian—and brings all parts of the land within reach of open water, except when winter freezing prevents traffic. Even in this case, the ports have had improved equipment for minimizing this natural handicap. To

regulate the flow of the Volga and the associated canals, a huge reservoir-lake has been formed by damming the river above Rybinsk.

Foreign Relations and Foreign Commerce.—During the years preceding the Second World War, the U.S.S.R. traded with other States on a system much like that current elsewhere. That is to say, it sold goods of which it had a natural surplus (e.g. timber and its products, and furs and hides) or which it could produce relatively cheaply (some forms of grain, and oil), in order to pay for commodities which it could supply for itself only at greater cost (e.g. machinery and industrial equipment, and wool) or which were not provided by nature within its territory (rubber and some non-ferrous minerals).

The war, however, brought the great changes already described, especially the extension of area on its western frontier and the enormous increase of production in the east of the Union. Added to these developments were those based upon Government policies, and in general the subordination of economic production and methods to political and military ends. Most notable were: (a) the creation of the belt of "satellite States" in East-Central Europe which will be described in the next chapter, and a great influence over Korea and China; (b) the division of Germany and Austria into West Zones and East Zones—the latter under the control of the U.S.S.R.; (c) the break of normal relations with the Western Powers: primarily the U.S.A. and also Great Britain, the British Commonwealth and much of Western Europe. These developments lowered a "curtain" between the Union and much of the rest of the world—a curtain which, if not of iron, hindered exchange of goods and outward passage of information about the production and trade within the Soviet sphere of influence.

The result was to change the character of the trade relations between the Soviet "bloc" and the States outside it to an unprecedented extent. It has already been explained that even among the Western Powers, the governments had to various degrees controlled the activities of individual producers and merchants; commerce was no longer a simple matter of exchange on economic grounds, and everywhere *laissez-faire* had had to give way as a principle in external as well as internal business. But the trade of the U.S.S.R. was much more affected. Its amount was greatly diminished, especially after the outbreak

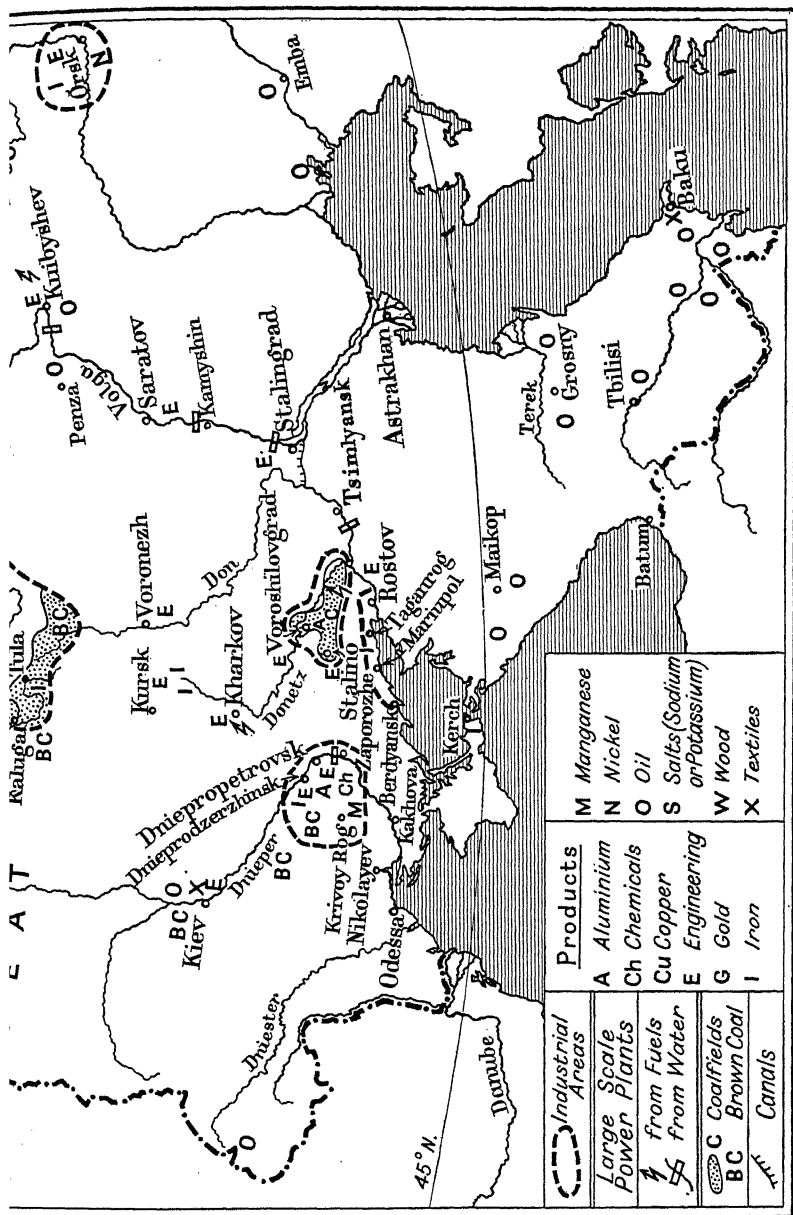


FIG. 80.—INDUSTRIAL AREAS AND CENTRES OF THE U.S.S.R. IN EUROPE.

of the Korean War, when the U.S.A. determined that to hinder Soviet aid to the Chinese combatants, no goods which could be used for that purpose could be sent into the "bloc."

Cutting down foreign commerce would quite cripple some States, but the U.S.S.R. and its allies were not so dependent upon this form of exchange, as their huge extent satisfied most of their needs, except for rubber and some other products of equatorial regions. The chief immediate aim of the Union's economy was to build up its internal strength, and external contributions to this were sought only as opportunities offered for exchange of particular commodities from particular sources. No definite and constant pattern appeared.

Between the U.S.S.R. and the other States of the Soviet bloc, however, occurred what was probably the greater part of its commerce, for the production of the satellite States was geared to that of the U.S.S.R., and this meant transfers from one part of the bloc to another—whether or not they might be of equivalent value in the case of each separate State. In any case, the Soviet Union played the part of a central exchange.

The Population of the Union.—The numbers of the Soviet peoples, their distribution and their conditions of life, cannot be based on definite figures, as they would be in most countries of Western Europe. In the U.S.S.R. and the satellite States many statistics are either lacking or issued in a form from which no exact and consistent results can be obtained. Statements can therefore be regarded only as estimates, however carefully they have been prepared.

The tables of areas and population given above are accurate enough for their purpose, viz. to be compared broadly with each other and with those of the rest of Europe. But it must be remembered that changes are rapid and that migrations on a large scale have occurred and some may still be occurring. That is an important consideration if in any particular respect one attempts to compare the present with the past of the Union, and it also has to be borne in mind that since the outbreak of the Second World War the boundaries of the U.S.S.R. have greatly changed and many comparisons are therefore impossible.

In preceding parts of this book some general facts have been given about the movements in Eastern Europe of people of various nationalities, languages, occupations, etc., and other facts will be found in the next chapter in connection with the

satellite States. In the case of the U.S.S.R., it may here be emphasized that there has been, and still is, a marked tendency for an increase of the population engaged in industrial and commercial work in towns and cities with a corresponding decrease in the numbers working upon the land. Hence overcrowding in large centres has been serious, and it must tend to remain while large resources are used for arms or capital goods.

It may also be concluded from what has been written already that in the U.S.S.R. unemployment is no difficulty, though with the changing policies of the State the kind and place of people's work may be changed. Further it has been indicated that wages and salaries vary considerably and it may be deduced that, instead of a pre-revolution cleavage between the two classes of "rich" and "poor," there are many wide differences in earnings. It is impossible to make an estimate of the average "real earnings," and hence to determine the average standard of living with any approach to accuracy. All one may dare to say is that while in the past there was a much lower average standard of living than that of Western Europe, the level is now raised and there are no longer masses living in poverty.

In the matter of the increase or decrease in the numbers of the population in the European area, there are again no statistics of present tendencies. Without doubt, the balance between the birth rate and death rate in the past gave a high net reproduction rate. Apart from war-time interruptions, the most likely change seems to be that better conditions of life have decreased the death rate.

Cultural conditions have been subject to political and military policies, and not all of them are relevant to a geographical study. But it is quite clear that a very great increase and improvement in popular education has taken place, and that this is connected with the change in methods of production; each is bound up as cause and effect with the other. This is true also about the provision of higher education in science as applied to industry and agriculture.

As regards the religions of the people, the policy of the Government has varied. In the earlier years of the new régime, the Orthodox Church was practically taboo; later, that and other forms of worship were permitted provided that they were not harmful to the Communist theory and practice. The case of the Jews is a special one; both before and after the Revolution

they were ill-treated in various ways, while during the war their numbers in the European area appear to have been reduced, by death or flight, from about 4 millions to little more than half that number. Also, whereas the earlier aim was to get the Jews out of the country, since the establishment of the Israeli State in Palestine, Soviet Jews are not allowed to leave—presumably that they may not strengthen an external Power.

The treatment of minority populations seems to depend on their willingness to become useful and voluntary citizens of the Union. Where that is the case, their characteristic cultural conditions, e.g. their languages and traditional literatures and songs, are permitted or actively assisted. By this policy the U.S.S.R. may justify its claim to be a “ multi-national ” State.

As to the future, all that one can safely say is that, apart from some cataclysmic occurrence or a major redistribution of political power, the present position of the U.S.S.R. among the States of the world will be considerably or even greatly improved in such matters as the numbers and the material conditions of its people, and the utilization of its enormous and varied natural resources.

CHAPTER XXII

EAST CENTRAL (TRANSITIONAL) EUROPE

BETWEEN Eastern Europe, which has close affinities with Asia in its physical and human geography, and Peninsular Europe, which has a markedly different climate and culture, lies a broad transitional belt running from the Baltic Sea on the north to the Adriatic and Black Seas on the south.

It comprises seven States which have been subject to such great fluctuations and transformations in their history that the whole area may be termed "the belt of political change." The extent of the changes within the last half-century can be seen by comparing the map in Fig. 26 on p. 92 showing the States before and after the First World War with that in Fig. 81 on p. 355 which shows the same group of States before and after the Second World War. As a whole, the area is that in which for many centuries there have been contests between "Asiatic" invaders and "European" defenders, and where the tides of conquest have swung now this way and now that. The greater part has been open to invasions from the east, and the south was the scene of Turkish domination; over many generations, whole populations have fled or been driven from their homes. It is against such an age-long background and its continuing traditions that the States of today have to solve their problems.

In the front rank of these problems is the establishment of Communist régimes, for after the Second World War, all were greatly affected by the policies and power of the U.S.S.R. In 1948, however, Yugoslavia refused to be controlled by the Government at Moscow and, alone of the States in the East Central group, it is not a "satellite" of the Soviet system though it is still a Communist State.

The term "transitional" is applicable not only to the geographical location of the group of States. They are transitional in their attempts to construct economic systems like that which was established a generation earlier in the U.S.S.R., and to a

considerable extent also in the development of their peoples from almost mediaeval to modern conditions of life and thought.

Poland.—Of the East Central States, Poland is the largest, and has the greatest population and natural resources. It has had a very long and chequered history, for by the middle of the 18th-century it had extended eastward far into what is now the U.S.S.R., yet a few decades later it was partitioned between Germany, Austria and Russia. After the defeat of these Powers in the First World War, it recovered its independence.

The Second World War began in 1939 with the invasion of Poland when the German armies swept over the country, occupied it and did incalculable damage. During this time, the Polish Government migrated to London and almost lost touch with the people of Poland. In 1941 the U.S.S.R. was forced into the war, and then gave help to the "Underground Resistance" in Poland, and Communist agents were parachuted into Poland. At the close of the war, Russian armies with Polish patriot bands again fought over Polish territory, and in the course of the war three-quarters of the capital (then Warsaw, now Warszawa) was destroyed. By the time of the liberation of Poland, Polish and Soviet Communists had obtained a dominating position in the land, and the exiled Government never returned to power. A new constitution set up a popularly elected Diet, which every seven years selects the President of the Republic who is assisted by a Cabinet of Ministers. The form of the governmental system is like that of the U.S.S.R. in a number of ways, especially in the fact that effective power is in the hands of a few men—the Council of State, consisting of the President and nine other members, which can make final decisions and override the representative Diet.

At the close of the Second World War, in 1945, the victorious U.S.S.R. insisted upon an agreement with its allies, the United States and Great Britain, that Poland's boundaries should be modified on both fronts: on the east it should cede the territory claimed by the Soviet Union, and on the west it should gain all of Germany as far as the lower Oder with most of East Prussia in the north. In effect, therefore, the present Poland may be considered as having been thrust bodily westward. That is literally true of a considerable part of its population, for while very large numbers of Poles left the now Soviet area of the east to be resettled in Poland, there was a westward displacement

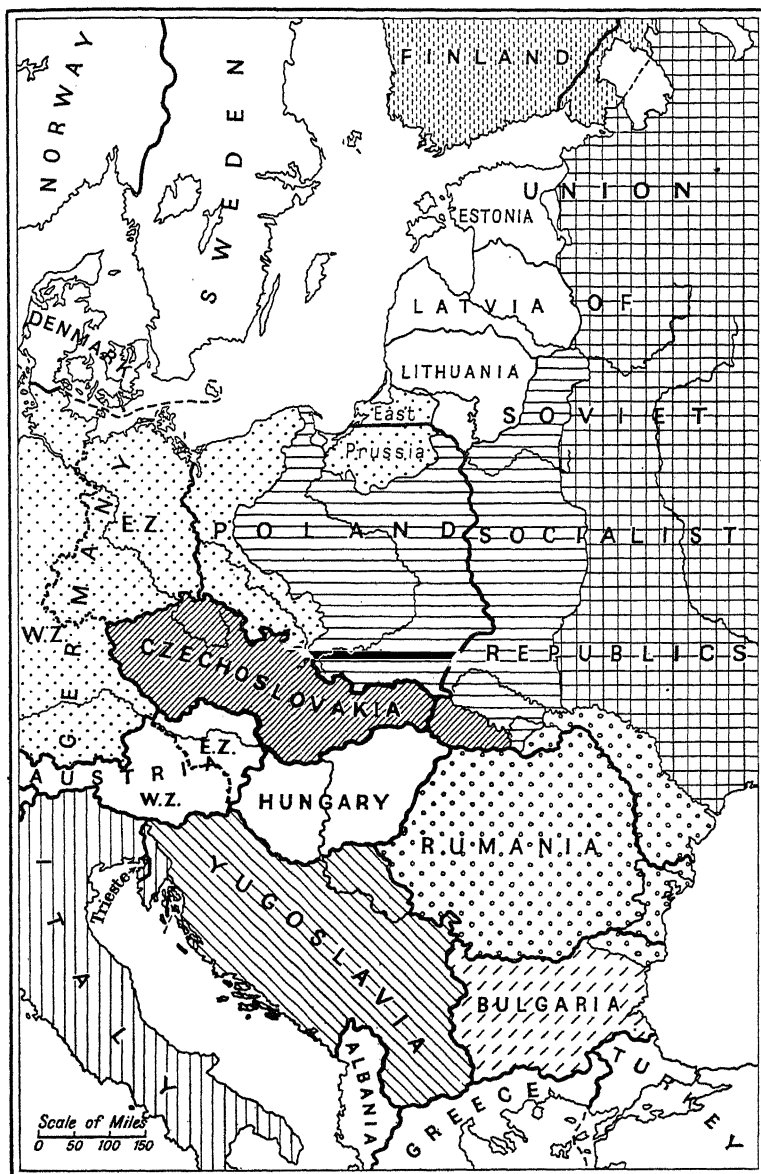


FIG. 81.—STATE BOUNDARIES BEFORE AND AFTER THE SECOND WORLD WAR.

Note.—The thick lines show post-war boundaries; the shadings indicate the pre-war territories of those States in which changes occurred.

of several millions of Germans from the new territory and their replacement by over 5 million Poles.

Further changes in regard to the population must be considered. Not only did Poland suffer worse material devastation than any other State, but 6 million Poles lost their lives—about one in six of the pre-war population of 35 millions. This fact explains some of the difficulties in post-war reconstruction, and also the hatred felt against Germans and the determination not to allow them in the “Regained Territories.” The net result is that the population is now remarkably homogeneous, compared with the pre-war condition in the “old” Poland. The boundaries of the State almost coincide with those of the language-groups. (Contrast the map on p. 84 with that on the back end-paper.) Also the religious minorities of the Greek Orthodox and the Jewish faiths have largely disappeared, and the Roman Catholic religion overwhelmingly predominates among those who profess a faith. This fact has political significance since the new State and the Roman Catholic Church were strongly opposed on a number of political and social issues, and many Polish citizens were compelled to decide between divided loyalties.

As a consequence of the war and the territorial changes, the number of the population decreased from 35 to 25 millions, and the total area of the land from 151,000 to 121,000 sq. miles; consequently the average density of population was reduced from about 232 to about 206 persons per square mile.

The aims of the Communist rulers were twofold. One was political: to establish a “new order” based as far as possible on the pattern of the U.S.S.R. The other was economic: to restore and increase the productivity of the resources of the State, and particularly those of the new acquisitions—the agricultural lands of the former Prussian areas and the mineral-bearing and manufacturing region of Silesia. The economic ends could be achieved, it was believed, by following the plans of the Soviet Union as its experiences of thirty years had shaped them, but it proved necessary also to take into account certain differences between the Russian and Polish peoples.

In Poland, the greater part of the land had for centuries been in the form of large estates belonging to the nobility and other wealthy people, but during or just after the war many of the owners had disappeared. The first idea of the new Government

was to divide most of the farmed land into small or very small holdings and give these to the peasants who had worked on them; these now numbered, with their families, 15 million persons. Apart from these small farms, some were given to the establishments belonging to the Co-operative Movements which before the war had developed greatly in Poland, and also a small proportion of the land was retained for large State farms.

The small farms, however, proved unable to supply the food the State needed, particularly as in Poland much of the land had been devastated, the buildings and equipment destroyed, and the livestock removed by the Germans. Therefore in 1945 the Government adopted plans for collective farms, but the new owners resisted this attempt, and various modifications of the Soviet system had to be introduced, particularly in order that the peasants should retain their legal right to their land. The Poles strongly opposed losing land already given to them, and also, unlike the Russians, they had not in past times become used to a village community system. New arrangements were made; e.g. although they would work in common, they might receive a rent for their land as well as payment for their labour, and in some cases they would, at least in theory, have a right to complete withdrawal.

Other troubles with the peasant population (more than half that of the whole State) have occurred in Poland, as elsewhere. This was particularly notable in the supply of food to the towns, and there was organized resistance to its compulsory seizure.

Another problem which Poland faced in common with many other lands was the change from the use of human and animal power to that of machinery; this met with the two common difficulties: the objection or inability of the workers, and the provision of tractors, etc., which at first depended largely upon the U.S.S.R. Till adequate supplies could be got, and used, the total productivity of Poland was bound to be low. Yet when the farmers employ modern methods there is every prospect of greatly increasing the total amount of agricultural produce above the pre-war amounts.

States which are predominantly agricultural, particularly when they are over-populated, feel the need of increasing their industries. This has been the case in Poland, and its acquisition of the whole of the Silesian mining and manufacturing region has

given it an opportunity of which it has taken full advantage. Within a few years its output of coal was increased by two-thirds, that of iron ore was more than doubled and that of zinc and lead had increased to a much greater extent. The working of these basic materials and the industries dependent upon them were described in Chapter VII; one need here refer only to the initial difficulties in getting the region again working. These were to replace the skilled German managers and workmen, and to provide capital and plant for re-equipment; hence this work was given the first priority in the programme of the State.

All the fundamental industries are now nationalized, but there is also a great deal of production carried on by the many enterprises allotted to the Co-operative Unions. Their branches number thousands, engaged in the processing of farm products, the provision of building equipment and the construction of houses, the making of textiles, clothing, paper and many other necessities. In addition, they have agencies for buying and selling for farmers, and retail shops in town and country. Finally, small private enterprises may operate in certain ways.

The map in Fig. 82 on pp. 364 and 365, cannot of course give the distribution of all the industrial centres or all their products; it is only an attempt to show, in a general way, the main areas and some of the scattered localities of industrial development at the present time. This map indicates also the situation of the ports and the gain of Poland in acquiring Szczecin, at the mouth of the Oder River, as a means of entry and exit from the main industrial region.

Foreign trade, however, was reduced to small dimensions in the post-war period. In addition to commercial and financial difficulties facing many of the States of Europe, those in the East Central belt had to surmount the political barriers between "East" and "West." Probably the trade of Poland will, for a long time, tend to be mainly with the U.S.S.R. and other Communist States, while that with other parts of the world will be relatively small.

When the agriculture, industry and commerce of Poland have developed into a well-balanced system based upon better natural resources than the State possessed in the past, there will be a better prospect of dealing with the problem of over-population. Till a generation ago emigration had been a palliative, but this cannot suffice, for the net reproduction rate is high. Only

considerably greater agricultural and industrial production can support an increasing population at an average standard of living above the low level of the past. Another way in which the mass of the people of Poland may be more fortunate than in the past is in the standard of education, for a system of compulsory and free education for all, and at all grades, was instituted after the war and planned to be in full working within 10 years.

Czechoslovakia.—The Czechs and the Slovaks come from the same branch of the Alpine racial group, and their West Slav languages differ somewhat from one another because in recent times the former were under the domination of German-speaking Austrians and the latter under Magyars. The Czechs live in the provinces of Bohemia and Moravian-Silesia, and for hundreds of years there was an independent Kingdom of Bohemia before it was incorporated into the Austrian Empire in the 17th century. In both of these States, the Czechs had opportunities of development in economic and political affairs. Indeed, during this period the Czechs (alone among the peoples of the East Central belt) had acquired a West European type of culture and looked outward largely, though not entirely, in a westerly direction. The Slovaks, however, who lived mainly in the Carpathian valleys which drained southward to the Danube river-system, were oppressed by the Magyars when they came under the Kings of Hungary. Consequently, when the present combined State was formed in 1918 after the break-up of Austria-Hungary, the Czechs were better educated, had learnt better methods of farming, had established industrial and commercial enterprises, and had even taken some part in the Austrian government. Also the Czechs were twice as numerous as the Slovaks, and hence they played the major part in organizing and administering the new State. Attached to the two main portions of Czechoslovakia was the "tail" of Ruthenia, occupied in the main by a relatively small number of Ukrainian settlers.

Far more important was the minority consisting of German-speaking Austrians who numbered about one-fifth of the total population of nearly 15 millions in the new State, and who lived around the margins of Bohemia and in the north of Moravia. They objected to being included in Czechoslovakia; in 1939 the annexation of their territory by Germany heralded the outbreak of the Second World War.

Very soon the whole of the State was subjugated, and the

Czech portion was occupied by the Germans, but the land did not suffer loss of life and destruction of property to the extent experienced by other countries similarly overrun. Many of the factories of Bohemia and Moravia were kept working at military production for the invaders, and they were then bombed by Allied air forces. Land communications were also attacked, and the navigability of the Danube was wrecked.

After the U.S.S.R. had been brought into the war, Czechoslovak Communists were the leaders in a resistance movement, and at the close it was the Red Army which played the decisive part in the liberation of 1944-1945. The pre-war Government returned from its exile in London, and the dominant feeling of all the Czechoslovak leaders was that only the Soviet Union could protect them from further German aggression ; the earlier westward outlook seemed to have failed them. The first post-war Government was a coalition of a number of political parties, but gradually Communist power increased and in 1948 a *coup d'état* occurred. After this, Czechoslovakia was transformed into a Soviet State, and the methods of government were by successive stages changed and followed the pattern common throughout the Soviet bloc. As in other parts of East Central Europe, conflicts between Church and State arose.

Meanwhile, the western boundary of Czechoslovakia had been restored to its position before the German annexation, though Ruthenia was annexed to the Ukraine—a transfer removing a minority problem which might have been a cause of later trouble. Many of the German-speaking minority in Bohemia and Moravia, which numbered over 3 millions, left to go into Germany and most of the rest were deported by the Czechoslovak Government which had determined to allow only a small number to remain who would voluntarily assist in maintaining the mining, industrial and commercial undertakings in which they had been engaged. A large number of Czechs and their families had to be removed from the interior to replace the previous workers in the depopulated marginal lands. Also large agricultural areas in these districts were abandoned or confiscated and were distributed to new tenants, while forest lands passed to the State. The pre-war boundary of Slovakia had included many Magyars in the southern part, particularly in the Danube Valley below Bratislava, but few changes of population occurred

peasants should remain in this region (see the end-paper map).

Immediately after the liberation from the Germans, the coalition Government nationalized a large part of the mining, manufacturing, transport and commercial enterprises, and the process was completed after 1948. The greatest difficulty was in the supply of man-power, especially skilled workers and managers, but by various devices production was increased and by 1950 the basic necessities of power and minerals had surpassed their pre-war amounts. Indeed, the economic role of Czechoslovakia in the Soviet bloc had come to be that of importing raw materials from the U.S.S.R. and other Communist States and returning a part in the form of clothing and machinery, as well as making a considerable contribution to armament production.

Farming in Czechoslovakia, especially in the western part of the State, had for a long time been more productive than that over much of East Central Europe. Also, when the German-speaking owners had gone, there was more land for the remaining labourers and hence a larger amount of produce could be made available for the population. At the same time, because of the exodus of industrial workers, there was not, as in most of the eastern part of the continent, a rapid increase in the number of town dwellers. For these reasons, the State did not need to force the farmers to change their methods—a proceeding that in all States proved difficult and sometimes temporarily almost disastrous. Collectivization was therefore not compulsory, and by 1950 only about one-quarter of the villages had farms of this type, and only about one-sixth of the arable land was cultivated in common. Thus, apart from the legacy of the war-time troubles and the post-war dislocations, and also apart from the bad harvests which occurred here as over much of Europe in the earliest post-war years, the production of food supplies in Czechoslovakia remained about normal, and the pre-war dietary level was soon attained.

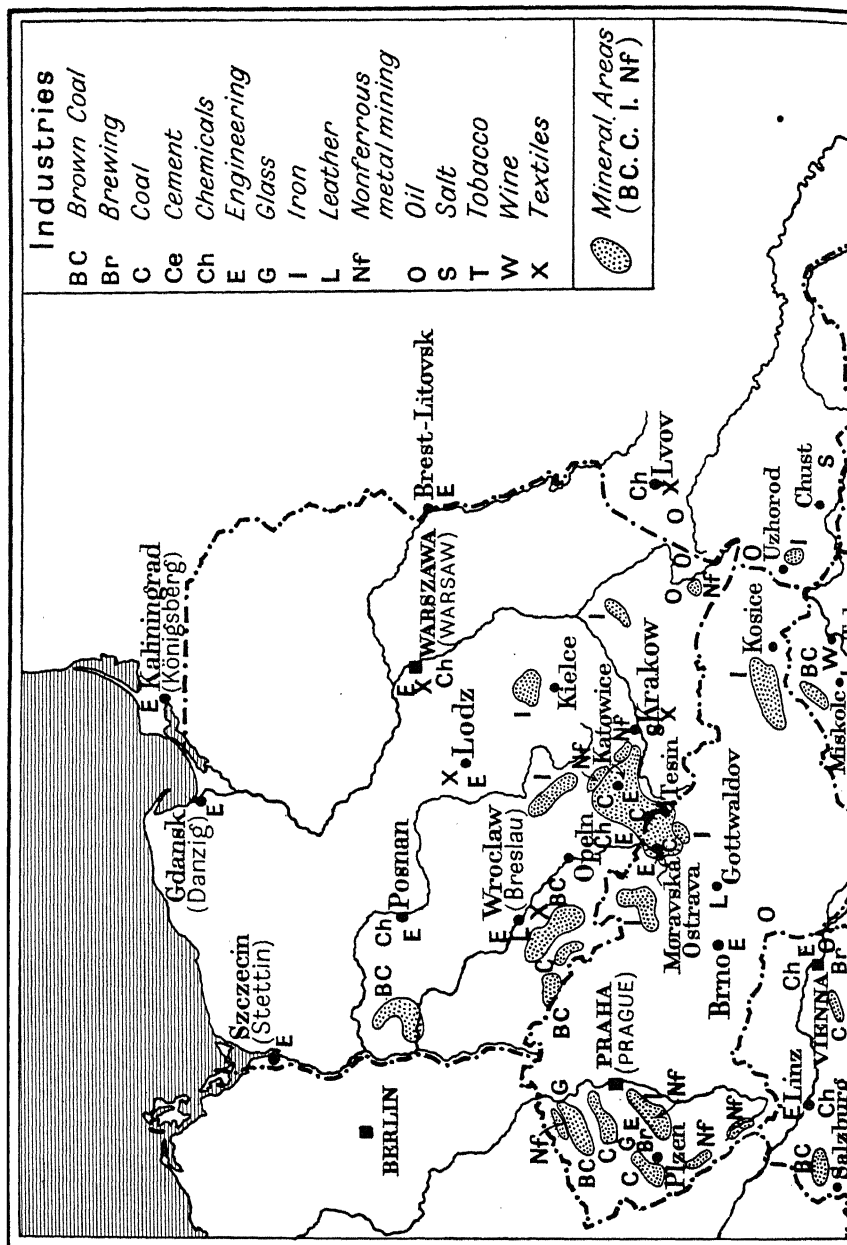
The loss of territory which the State suffered as a result of the war was about 10 per cent, and the population was reduced in approximately the same proportion; the area is now some 49,000 sq. miles, and it supports about 13 million persons. The resultant average density of population is 265 to the square mile, a number higher than that of any State in the eastern

part of the continent. As is common in the States which have experienced changes in their area and their peoples, the population is now more homogeneous than before the war in regard to language and feelings of nationality. Most of the people profess the Roman Catholic faith though, as elsewhere in the East Central belt, there have been dissensions between the civil authorities and the Catholic Church.

Czechoslovakia as a whole ranks among the industrialized States of Europe, but it has a well-balanced economy; the proportion of the population engaged in industry, mining and transport is about equal to that employed in agriculture and forestry. Its standards of productivity and living are, like its geographical situation, almost midway between those of the East and the West of the continent. So, too, is its net reproduction rate, which is a little below unity; at present, however, the shortage of man-power is not a serious handicap to the well-being of the State and may be relieved by improved organization and by increased mechanization in agriculture.

Hungary.—The territory now comprised in the State of Hungary is situated in the heart of the Danubian Lowlands, and for many centuries it has attracted migrants from Asia. In prehistoric times tribes of the Alpine racial group appear to have worked their way along the Danube Valley and settled in the region. Then in the early part of the Christian era came various Asiatic peoples, including the Huns, who subjugated the previous inhabitants without dispossessing them.

At the end of the 9th century, across the Carpathians came the Hungarians, one group of whom were known as Magyars. They also dominated their predecessors; yet they intermixed with them to such an extent that though they imposed their language of Asiatic origin, their physical characteristics are now scarcely to be seen among the people who bear their name. They established the Kingdom of Hungary which, very much later, was incorporated into the dual Austro-Hungarian Monarchy, and this Kingdom came to an end in the break-up during the First World War. By this time, although most of the people of Hungary could speak the Magyar tongue and half were reckoned as "Magyars," power was in the hands of the great landlords in the country and some well-to-do inhabitants of the towns and cities. Besides the Magyars and others living



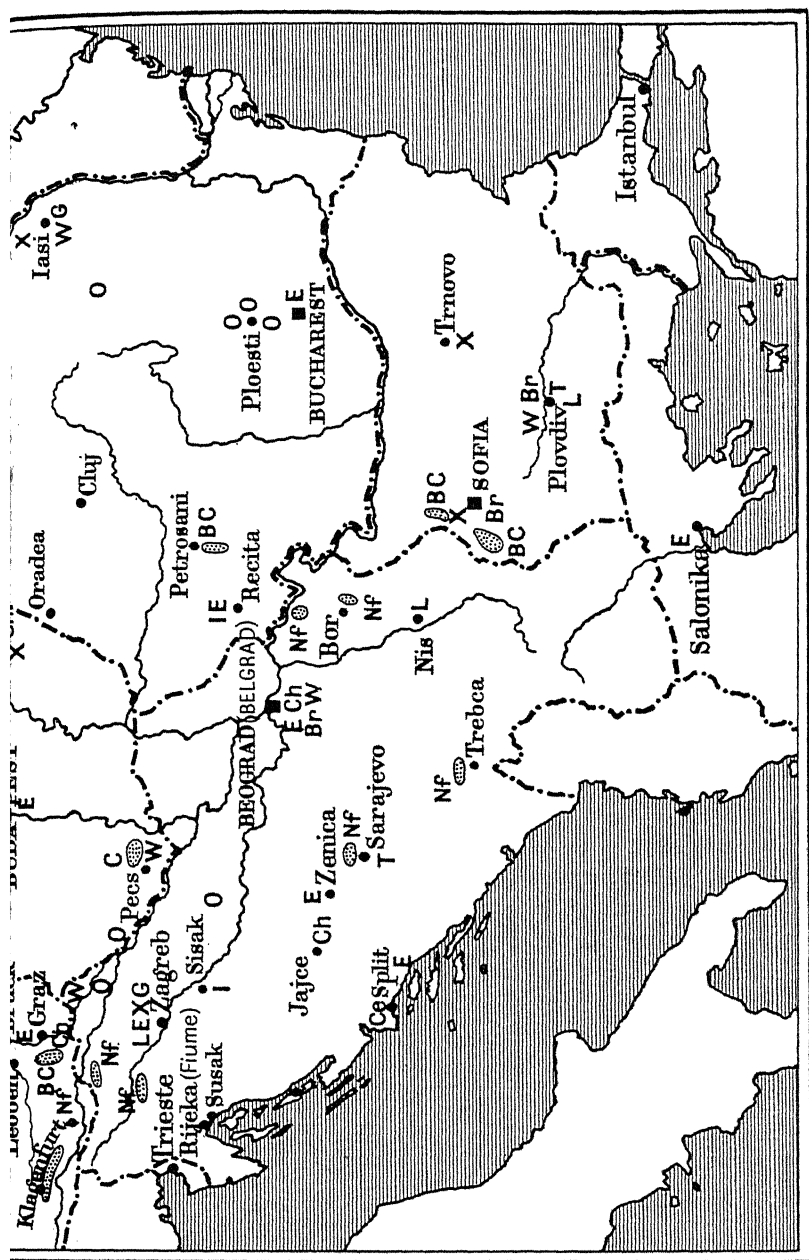


FIG. 82.—INDUSTRIAL CENTRES IN EAST CENTRAL EUROPE.

small or extremely small holdings. Yet, hindered by the economic dislocations, the universal poverty of the people and the bad weather conditions of the war and post-war period, production even of basic food-stuffs was in general inadequate for the farmers' needs, apart from the amounts which the Government attempted to secure for the industrial areas and for export to other countries in the Soviet sphere of influence. In spite of Government efforts to introduce communal farming, the peasants would not give up their lands, and by the end of 1950 a very small proportion of the arable area was held by collective farms and less still by the State. Reports at that time showed that less progress had been made in Hungary than in any other East Central State in a satisfactory system of land tenure and also in the supply of food and other farm produce.

Similarly, poor results attended industrial development, for the amount of mechanical power and raw materials was not sufficient for the attempted increase of manufacturing, and there was also a lack of adequate labour. Inflation, which occurred in so many States, reached such a point in Hungary that for a time money was worthless and trade had to be carried on by simple barter.

The total area of the State is 36,000 sq. miles (i.e. less than any other in this belt with the exception of Albania) and, with a population of 9 millions, there is an average density of 256 persons per square mile (a higher number than in any of the satellite States except Czechoslovakia). As Hungary has such comparatively poor resources, and for centuries past its Government has had little regard for the development or well-being of the people, it is not surprising that the standard of living has been and still is at a low level. The net reproduction rate makes it appear that the population is likely to retain its present size; hence only good government and an increase in general education and efficiency offer hope for an amelioration in the condition of the Hungarian people.

Rumania.—If it is asked: "What is meant by Rumania (or Romania)?" the answer cannot be a simple one. The area at the present time is shown in an atlas, but one must note also how greatly the boundaries have varied even since 1914 by comparing the maps on pp. 92 and 355. Also, if the answer has to take into account the areas in which the people are Rumanian, a complication appears when one studies the end-paper map.

Here one observes that if language is taken as a criterion two facts appear: (i) the majority of the people are Rumanian-speaking over a large part of Bessarabia in the U.S.S.R.; (ii) there are considerable areas inside Rumania in which the population speaks Magyar or German.

The Rumanians claim descent from Roman colonists in Dacia (corresponding to some extent with the present Walachia) and their language is derived largely from Latin. But their land was open to conquest by Slavs and others from the Steppes, and many of them fled to the valleys of the Transylvanian Alps. Between the waves of invasion, some of the Walachs (or Vlachs) returned to the plains and thus a racial mingling occurred. In course of time, these Dacian-Slavic peoples extended across the lower Danube, occupied Moldavia and even spread into Bessarabia. Another and somewhat similar situation developed on the western side of Transylvania at the contact of Rumanian hill-men and Magyars pushing up from the plains and the valleys. A later migration of German-speaking settlers added a further complication in the heart of the Transylvanian Basin. Also, what is now Rumanian territory was conquered by the Turks and it was not until the 19th century that, step by step, it obtained its freedom.

The modern State began in 1859 with the union of Walachia and Moldavia, and it then took the name Rumania. Since that time it has had constant changes of fortune with alternating extensions and losses of territory. The basic geographical factor has been its location between three powerful neighbours: the Turkish Empire from which it became completely independent in 1877; the Austro-Hungarian Monarchy which collapsed later; the Russian Empire which at first increased its might, then succumbed to revolution, and afterwards was followed by the still stronger and wider power of the U.S.S.R. Also, human factors have been sources of repeated disturbances and warfare in Rumania, for the mixed populations on its margins and within its borders have given cause, or excuse, both for its rulers to increase its territory and for its neighbours to attack it.

The changes referred to in earlier chapters, and shown in the two maps relating to the frontiers at the close of the First and Second World Wars, suggest only a small part of the conflicts, the tides of conquest and the enforced migrations which occurred before and between these two periods. It can therefore be imagined what has been the prevailing condition of the Rumanian

people : their material hardships and their lack of good government, peaceful living and any kind of education.

Under such conditions Communist doctrines and Soviet power brought Rumania into the group of satellite States, and a "People's Republic" was constituted in 1947. Yet effective progress in matters of land tenure and production was not secured. Expropriation of the great landlords was followed by the creation of mainly small holdings, but collective farming was adopted on a smaller proportion of the land than in any other of this group of States. With the intention of creating an "advanced industrialized-agricultural" economy, the Government formed State-companies to collect, process and distribute agricultural produce. This was a part of a plan for nationalizing all the natural resources and the industrial, financial and transport undertakings connected with them. To facilitate traffic from the Black Sea to the interior, a canal has been cut between Constanța and the Danube with a large new port, Midia, on the opposite side of the entry.

The difficulties which other East Central States encountered in the development of industries existed to a marked degree in Rumania, but an unusual measure was here adopted. After the war, the U.S.S.R. demanded reparations in the form of annual deliveries of oil, grain, timber, machinery, etc., and in the following year the two governments formed "Sovroms," i.e. Soviet-Rumanian companies for the more important Rumanian enterprises. The capital of the companies is shared equally by the two States, but a Soviet manager controls production and distribution. In the case of oil, there is a Sovrom which has the best wells and concessions for new fields, and also a Rumanian State company ; the companies previously belonging to other States have been expropriated.

The future of the whole economy of Rumania appears to be in Soviet hands, and information as to present conditions is almost entirely lacking. The area and approximate statistics relating to the population of the State are given in the Table of Reference on p. 289. One can add only that the pre-war standards of living were estimated to be lower than elsewhere in Europe with the exceptions of Bulgaria and Albania ; data for a net reproduction rate did not exist, and the only published figures indicated that both birth rates and death rates were the highest in any European State.

Bulgaria.—In the 7th century nomadic Bulgars set up a Kingdom of Bulgaria in Slav country south of the lower Danube ; in time their speech and racial characteristics were lost, but the State did not disappear until it was absorbed into the Turkish Empire. Meanwhile, a feudal system had developed in Bulgaria in which the nobility owned most of the land, and the Greek Church had become the religion of the people.

The Turks exterminated or expropriated the land-owners, and tried to force the Muslim religion upon the people. Yet feelings of Bulgarian nationality remained invincible and led to the Turkish atrocities of 1876. Russia then pushed eastwards and after a short war expelled the Turks and enabled an independent Principality in the north of Bulgaria to be established in 1878. From that time onward, the Bulgarian people have felt friendly towards the Russians.

The territory of the new State was gradually extended southward as the Turkish Empire weakened during the latter part of the 19th century, but when in the early part of the 20th century Serbia, Greece and Bulgaria finally broke the Turkish power (as explained in Chapter XX), Bulgaria's fortunes changed and it lost large areas to its Balkan neighbours. Later it joined the losing side in the First World War and suffered the losses shown in Fig. 26. In the Second World War, as in the preceding wars, it was the territorial ambitions of the rulers and not the common will of the people that decided the policy and action of the State, and near the end an alliance which the Government made with Germany gave the U.S.S.R. an opportunity of sending an army into Bulgaria in 1944. Confusion and bitter civil war resulted ; attempts at a coalition Government failed and a Communist group "liquidated" its opponents. A Communist State was then constituted, and the U.S.S.R. thereafter directed the course of the Bulgarian State.

A thorough system of State-ownership was applied in 1948 to all enterprises, even small ones with three workers, dealing with trade, finance and industry, but definite and comprehensive information concerning their working was forbidden ; industrial development, however, is certainly small.

Bulgaria is now, as it always has been, predominantly agricultural, but it has not had to go through the recent process of a break-up of great estates which has been common in the East Central belt of Europe. Turkish landlords had replaced

the earlier ones, and when the Turks went the feudal system disappeared. At that time the peasants took over the arable areas on which they worked, while forests and rough grazing became the common property of the villages. At the beginning of the Communist régime, therefore, nationalization of the land was not attempted, and voluntary formation of collective farms proceeded very slowly. But the holdings were generally very small and poorly worked; production was quite inadequate, and the inevitable happened. Collectivization was decreed, and although peasant opposition grew and local revolts occurred in 1950 and 1951, the number of collective farms was increased from about 15 per cent to 70 per cent. The methods employed during the transformation were drastic and similar to those of the Soviet Union in earlier decades.

At this time, the U.S.S.R. policy was to extend its control of the Black Sea coast southwards towards the Bosphorus gateway to the Mediterranean. Hence some hundreds of thousands of Turks who had still remained in Bulgaria were now expelled from the Black Sea area in the neighbourhood of Varna (now renamed Stalin). Other examples of the Soviet influence were the disestablishment of the national Orthodox Church, while in the schools religion was no longer taught and a six-year course in Russian became compulsory. In the way of trade, Bulgaria has arranged to send to the U.S.S.R. tobacco, alcohol and wood-pulp in exchange for oil, machinery and raw materials for industrial development.

As in the case of Rumania, statistics of population are uncertain, and to those given in the Table of Reference one can add only the general facts that standards of living have been and still are very low, and that it appears that the pre-war condition of over-population may be made worse by a markedly high reproduction rate.

Yugoslavia.—The great majority of the population are South Slavs descended from one of the racial stocks who in prehistoric times migrated from Central Asia *via* Asia Minor into the mountainous western regions of the Balkan Peninsula. They belong to the Dinaric or Illyrian group, and are in general taller than their "Alpine" predecessors. Moreover, unlike the other Slav-speaking peoples, they did not migrate northward and eastward into more fertile lower areas; hence their lands are less productive and their numbers are relatively few.



FIG. 83.—CONSTITUENT REPUBLICS OF YUGOSLAVIA.

A further disadvantage of their geographical location is that they have settled astride the routes leading from the Ægean Sea and the Straits to the Danubian river valleys and Central Europe. Through these routes the Ottoman Turks passed, ravaged the lands and scattered or oppressed the inhabitants. For centuries the Yugoslavs remained in the Turkish Empire and when it was gradually dismembered most of them came under the power of Hungary. The most powerful group were the Serbs who lived in what is now the northern part of Serbia; these folk rose against the Turks at the beginning of the 19th century and formed an autonomous Kingdom in the latter part of the same century. The remaining "wedge" of Turkish territory was broken up in 1912 (as was described in Chapter XX); Serbia expanded her realm southward to include the northern part of Macedonia, while Montenegro became a much smaller independent Kingdom.

The First World War began in 1914 with the assassination of the heir to the Austro-Hungarian throne at Sarajevo; this led

to conflict between Austria backed by Germany, and Serbia backed by Russia. Again the Balkan region was the scene of bitter fighting and at its close almost all the Balkan possessions of Austria and Hungary had revolted. Serbia now formed an important part of the new "Kingdom of the Serbs, Croats and Slovenes." This Kingdom included (a) the Kingdom of Serbia and the adjoining district of Bosnia and Herzegovina which lies to the west and is also mainly inhabited by Serbs; (b) the lands of the Croats and Slovenes which are situated farther to the north-west; (c) the previous Kingdom of Montenegro, where the people are Serbian in descent and speech. (These areas are approximately shown in the map of Fig. 83, which marks the corresponding Republics within Yugoslavia as it was re-constituted after the Second World War.)

Between the two World Wars, Yugoslavia was faced with great difficulties. These were partly external, as in the case of the quarrel with Italy over Fiume (Rijeka) and Trieste. They were also internal, for the Croats and Slovenes resented the small share in the government which was allowed to them by the King of Serbia and his advisers. Also, Serbia itself included large minorities who lived mainly in three areas: (i) North of the Danube near Belgrade (Beograd); some of the dwellers in the part of the Lower Hungarian Basin known as Vojvodina were Serbs, and on this account a considerable and populous territory had been assigned to Serbia, but there were also half a million Magyars and nearly as many German-speaking settlers. (ii) In the north-east part of the Albanian Gap, including the Metohija and Kosovo Basins, where (see p. 220) most of the relatively few inhabitants were Albanians. (iii) In Macedonia; in the upper Vardar region there were half a million people who spoke a Bulgarian dialect and had Bulgarian affinities. (These three areas are marked Vojvodina, M-K, and Macedonia on the map in Fig. 83.)

Other differences between the peoples in Yugoslavia showed themselves to be sources of trouble. Religious distinctions were sharp and often bitter. The Albanians and some of the inhabitants of Bosnia-Herzegovina were Muslims; most of the Serbs belonged to the Greek Orthodox Church; the Croats and Slovenes were Roman Catholic in the main. In regard to languages, also, equally definite contrasts existed. Besides those of the minority populations just referred to, Slovene is

officially recognized as distinct from Serbo-Croat. This latter language has two alphabets : the Serbs use the Cyrillic characters related to their Greek religion while the Croats have the Latin alphabet of the Roman Church.

The past political history of the various peoples of Yugoslavia, as it was after the First World War, made a unified and democratic government extremely difficult. Moreover, the Serbian monarchs proved personally unfitted to act as leaders of a parliamentary system.

This last factor proved decisive in the development of the State when the Second World War spread to Yugoslavia. Then the government signed an agreement with the Germans, but the people rebelled and it fled to London ; German troops overran Yugoslavia and for a time dismembered the State. But further risings of "Partisans," whose strongest leaders were Communists, liberated the country with Allied help and the old government was repudiated. In 1946 a new Constitution was drawn up, by which the "Marshal of the Partisans" was made President of the Council of Ministers—the acknowledged Head of the State.

In several ways the constitution was based upon Soviet models. An outstanding feature is its multi-national character, for the "Federal People's Republic of Yugoslavia" is composed of the 6 Republics shown on Fig. 83 : viz. Serbia (approx. pop. 6·5 millions ; capital Beograd) ; Croatia (3·8 millions, Zagreb) ; Slovenia (1·4 millions, Ljubjana) ; Bosnia-Herzegovina (2·6 millions, Sarajevo) ; Macedonia (1·3 millions, Skopje) ; Montenegro (0·4 millions, Titograd). Moreover, within Serbia itself are : (a) in the north, the "autonomous province of Vojvodina" with its Magyar and other minorities ; (b) in the south, the "autonomous regions of Kosovo-Metohija," inhabited chiefly by Albanians. The aim is to achieve an agreed measure of unity from what has hitherto been a mosaic of disparate and often conflicting elements ; the constitution also guaranteed freedom of religion and language, speech and assembly, to the minorities as well as the majorities in each Republic. The constitution also laid down that minerals and other natural resources were national property and that communications and foreign trade were to be organized by the State.

At the same time economic reconstruction was begun to relieve distress, and to repair the extremely heavy damage resulting from successive wars ; in many areas food, housing

and clothing were almost lacking. Moreover, loss of human lives had been such that it was estimated that in the last war alone one-seventh of the population lost their lives. The broad pattern of economic reform was that of all Soviet States, viz. greater agricultural production and the development of industry.

Land reform had already begun with the breaking up of the large estates and the distribution of small holdings to the workers ; poverty and inexperience prevented them doing little more than to keep themselves and their families alive, and few accepted the government's invitation to work on co-operative or State farms. To develop industries, plans had been made for a number of towns along the coast, and in the Sava and Danube valleys where there was railway and road communication, in order to produce such necessities as cement, steel, basic machinery, leather and textiles. There was, however, no comprehensive adoption of State ownership of industries ; private property and private enterprise were to be allowed a share in the national reconstruction. Of course, the schemes met the common difficulties of lack of capital, equipment, skilled labour and management.

Outside help was required both in rural and urban areas and it was at first given by the United Nations Relief and Rehabilitation Administration (U.N.R.R.A.), in the form of food and other supplies. Also trade with countries both to the east and the west was arranged by the Yugoslav government.

However, before much economic improvement was made, a split occurred between Yugoslavia and the other Communist States of Europe and the U.S.S.R. In 1947 a " Communist Information Bureau " was set up jointly by the official Communist Parties of these States and was known as the " Cominform." Almost at once the Yugoslav Communist Party was expelled on the ground that its leaders had " pursued an incorrect line on the main question of home and foreign policy." This break between Yugoslavia and the Cominform States had three main consequences : (i) trade between the two parties was stopped ; (ii) trade with the West was continued and American aid was accepted by Yugoslavia as by other European States ; (iii) threats of attack from the Satellite States were met by rearmament on the part of Yugoslavia.

These developments did not mean that Yugoslavia had become one of the Western States. It still retained its Communist ideology though it proceeded to carry it out on its own lines.

In 1947 a 5-year plan was published to deal with all branches of the national economy. In addition to the State rights which were laid down in the constitution, the plan now nationalized all industries and trade, and private enterprises were gradually eliminated. Yet there were not the centralization of power and the unified direction of production of all kinds throughout the State which characterized the Cominform group. In the first place, each of the six Republics had its own sphere of interest and of organization, distinct from those of the Federal Government. In the second place, within each branch of industry more freedom was given to local authorities and particularly to the workers' councils in the various enterprises. The developments that followed the first publication of the 5-year plan were to a considerable extent of the "trial and error" type, and progress was irregular. Schemes are now more carefully planned, and aim at co-ordinating all stages of industry from the construction of hydro-electric power-plants in the mountains to the sale of consumer goods in towns and villages.

Agricultural advance was slow. Even by the beginning of 1952 the co-operative farms included only one-fifth of the peasant holdings. It is significant that the proportion is much higher in the richer and more advanced lands of the plains of Vojvodina, and much lower on the hillsides and in the valleys and small basins of the poorer and more backward mountainous areas. At this time the amount of food production and its supply to the towns were still matters of great concern to the government. Yet the employment of force, to overcome the difficulties in this land of such great contrasts, both in physical conditions and also in the peoples, might shatter the very existence of the State.

On an area of about 96,000 sq. miles live 16 million persons. Because of the mountainous character of Yugoslavia and the fact that most of the people get their living on the land using agricultural methods as primitive as almost anywhere else in Europe, an average density of population of 166 to the square mile has meant, and still means, a low standard of living. Yet in view of the latent mineral deposits and the possibilities of utilizing water-power, industries may add considerably to the total resources, and the government may build up a better economic system for the benefit of the Yugoslav peoples.

Albania.—The Albanians are in descent and physical characters akin to their Serbian neighbours, but they have kept their

own primitive Aryan speech, a feeling of distinct nationality and also many old customs. There have been intrusions by Greek, Roman and Slav colonists into various parts of their land, so cut up by nature, and they were completely subjugated by the Turks. An important result of these influences is the marked differences among those who regard themselves as Albanians. For example, in the central part of the country the people became Muslims, while in the south the Greek Orthodox Church had many adherents and in the north were many Roman Catholics. In language, dialects differ greatly and northern Albanians may not understand those of the south. Village and tribal groups count for more than any loyalty to the whole nation, and feuds between the small communities have been common. Economic development has been backward and education almost lacking.

When the Turks were driven out, various Powers made schemes for the future of the area, and after various attempts and failures at government, Italian troops occupied the country just before the Second World War. At the close of the war, the U.S.S.R., the U.S.A. and Great Britain recognized a provisional government which had been set up in Albania. Then, as elsewhere in the belt of transitional States, elections resulted in a Communist-controlled Assembly and the proclamation of a Republic in 1946.

In the same year a treaty was made with Yugoslavia, whose territories almost enclose Albania on the landward side, to provide very close economic working between these two Communist States. But when Yugoslavia was expelled from the Cominform, all relations between them were broken off and the frontiers were barred to passage of persons and goods. As a similar ban has been put on maritime and air communication with other States, except for a very small number of ships and planes passing between Albania and the U.S.S.R., Albania has been virtually cut off from the rest of the world. The few reports which have emerged indicate that the country is administered, nominally under an Albanian government, by some hundreds of Russian advisers, officers and technicians. In view of the internal and external circumstances, it would seem inevitable that this tiny State of rather over 1 million persons must remain for a long time in the chaotic, backward and poverty-stricken condition which has persisted for centuries.

CHAPTER XXIII

WEST CENTRAL EUROPE

Switzerland.—From what is now Swiss territory flow head-streams of the great rivers of western Europe : Rhine, Rhône and Po ; consequently, within historical times intruders from the surrounding populous lands worked their way up the valleys and imposed their respective languages upon the earliest occupants. Yet the present dominance of the Alpine racial characteristics shows that the descendants of the prehistoric settlers have maintained themselves, and only in the plateau area of the north do Nordic traits show themselves to-day.

Although entirely enclosed by its neighbours, Switzerland stands apart from them to an unusual degree in political, and even in some economic matters. This is largely due to the situation of the Swiss in a mountainous region and to the circumstances of their origin as an independent nation. The State of Switzerland began in 1291, when the men of four valleys leading down to Lake Lucerne banded themselves together against attack and formed a league of the cantons of Uri, Unterwalden and Schwyz (whence the name Switzerland). In the next three centuries the league extended by the accession of other cantons whose peoples spoke similar dialects of Germanic origin. But the rather loose Swiss confederation was conquered by Napoleon, and in the peace settlement of 1815 the Great Powers gave it a definite constitution, with a guarantee of inviolability and an obligation of perpetual neutrality.

At the same time, border-areas were included which became new cantons : French-speaking on the west and south-west, Italian-speaking on the south-east, and German-speaking on the east, although in a number of the eastern valleys the old Romansch dialect is still the common speech. All the four languages are now officially recognized by the State. Yet the cantons have lived so much apart from one another that commonly the spoken tongues are dialects, and the respective standard languages need to be learnt in the schools—where also a second one of the four is frequently taught.

In the south, most of the people have retained the Catholic faith, but the Reformed Churches spread so much in the north that their adherents number a majority in the population.

In the middle of the 19th century the Swiss drew up a new constitution in which the principles of independence and freedom were shown in connection with both external and internal affairs. In the international field, neutrality was again laid down as an essential policy, though from that time onward it has been increasingly interpreted as an armed neutrality. In the internal sphere of government, the fundamental principle of freedom was applied in two main ways. First, each of the 22 cantons was to be "master in its own house" in all matters except those specified in the constitution. In the beginning, the Federal Government, formed by representatives from all the cantons and sitting at Bern, had a minimum of power, but within the next hundred years technical developments made it necessary for the central authority to take over duties relating to banking and currency, customs' tariffs, posts and railways, and some dealing with the internal conduct of economic affairs.

Secondly, the constitution ensures that persons are not to be deprived of their individual rights of expressing their opinions in politics. The central "State Council," corresponding to the British "Cabinet," was to be guided in matters of general principle, not only by the representatives from the cantons, but by a Referendum to the whole of the voters upon proposals simply requiring "Yes" or "No" as the answer. In practice "No" has frequently been the verdict, and the government has tended to be distinctly conservative and has changed its policies more slowly than has been the case in most States. (It may here be noted that in Switzerland women have no vote in any election of a political body, and that no referendum has been demanded upon this issue.)

Within this constitutional framework, the Swiss people have shown their spirit of independent enterprise and hard work by making great advances. Facts regarding production and trade have been given in some detail in preceding chapters; in the present section are noted only some ways in which the economic developments are related to the political system.

Pastoral and agricultural work was, of course, in early times the basis of the economy of the State, but with the growth of

and now scarcely 20 per cent of the population depend upon it. The peasantry (as in other countries) feel a certain amount of antagonism against the townsfolk, notably in the relative amounts of taxation laid upon them. The workers on the land have also demanded, and obtained, customs duties on imported products to protect them from foreign competition; by this, food prices have been raised and town-dwellers feel a grievance.

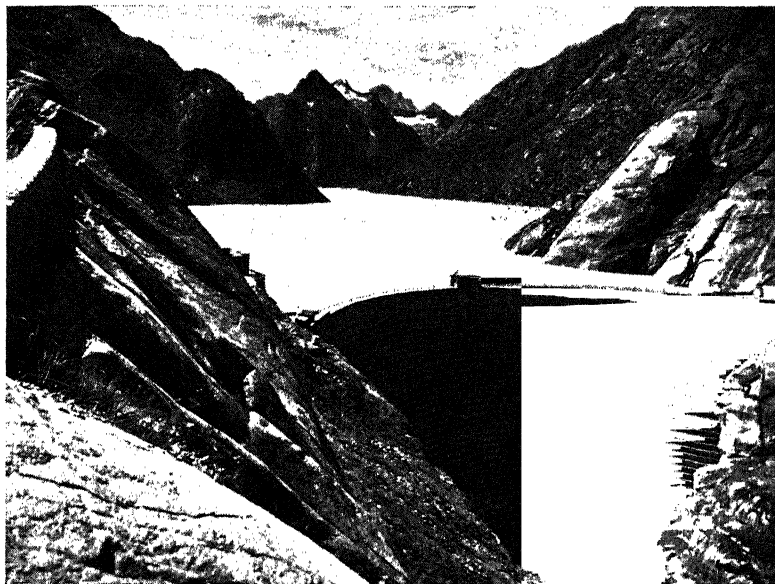


FIG. 84.—VIEW OF A SWISS ELECTRICITY INSTALLATION.

Note.—The recently constructed dam has transformed the head-stream of the R. Aare into the "Grimsel Lake" fed throughout the year from two glaciers about three miles upstream. The height of the dam gives an idea of both the depth of the reservoir and the "head," i.e. the fall, of the water to the turbines.

The rise of industries from the latter part of the 19th century, and therewith the development of commerce and the growth of town and cities, have been remarkable. In spite of a common lack of raw materials and of fuel for power, manufacturing has increased rapidly, especially after the widespread use of water-power. One branch of manufacture after another has been added, till now Switzerland is one of the most highly industrialized States in the world. The products of heavy and light engineering, and of the chemical and textile industries, constitute the

bulk of the exports ; only a tiny proportion consists of chocolate, cheese and other foodstuffs.

Like the other Alpine States, Switzerland is increasing its utilization of power from the rivers and the melting snows. Yet here, where there is great need, an obstacle exists in the constitutional system. A canton can veto a scheme proposed to be carried out within its cantonal territory, and in more than one instance a local objection, perhaps on behalf of the tourist industry, has prevented the use of much water-power.

The practically universal employment of electricity has affected the social aspects of industry. Factories are clean and healthy, and many are situated in small settlements or even in mountain valleys ; there are very few large towns. Another instance of the influence of the type of industrial development on social matters, is its extensive demand for highly skilled labour and therefore the provision of appropriate education ; the Universities devote themselves specially to science and the Polytechnic at Zürich has a world-wide reputation.

Switzerland maintained its neutrality in both World Wars, and suffered little in comparison with the other States. The second one, however, affected its economic conditions in a number of ways. During the war there could be little trade and industrial methods had to be changed. This necessitated intervention by the central government, and the old system of *laissez faire* had to be modified ; yet State control has not gone as far as in most other countries of Europe.

Switzerland has an area of only 16,000 sq. miles and much of that is mountainous. It is therefore a tribute to the character of the Swiss people that they number $4\frac{1}{2}$ millions, while with an average density of population of 275 persons to the square mile, their standard of living is the highest on the continent.

Austria.—The western and central parts of Austria are high-land, with either Alpine or marginal mountain ranges and valleys ; in the east are lowlands both north and south of the Vienna Basin. The people are descended from three stocks : from the south and east came those of the Alpine group and their Dinaric successors, and later Nordics intruded from the north and north-west. The physical traits are now generally mingled, and a marked distinction between them is seen only in the broader Alpine valleys which lead respectively from the south and the north.

Almost everywhere the German language is spoken, for in the Middle Ages Austria was one of the Germanic States, and separated from a German confederation only in 1866, when it was defeated by its great rival Prussia. It remained, however, as the dominant partner in the Austro-Hungarian Monarchy. After the First World War and the loss of territory to Czechoslovakia, Italy and Yugoslavia, the present Austria was left with few except German-speaking inhabitants; the chief exception is that of a number of Slovenes in the Klagenfurt Basin.

Although between the two World Wars Austria was but the "rump" of the former powerful State, it remained an independent Republic until March 1938, when Germany began its conquests by the forcible annexation of Austria. In 1945 it was liberated, but was then occupied and administered by the four chief Allied Powers.

The U.S.S.R. held all the north-eastern area, commonly known as the Soviet Zone, except Vienna. The United States held the north-western zone, Britain the southern zone and France the extreme western zone. (On the map in Fig. 81, the Soviet or Eastern Zone is indicated by "E.Z."; "W.Z." marks the combined area occupied by the Western Powers.) Vienna itself, although enclosed by the Soviet Zone, was divided into four sectors, each governed by one of the four Powers; it was also the meeting-place of the Allied Council which represented these Powers in controlling the State as a whole. Moreover, the Republic of Austria had its own Government, which had limited functions and could exercise only that amount of authority allowed to it by the occupying Powers. The seat of this Austrian Government was also in Vienna.

The four Allied Powers differed among themselves in various matters, and in particular there was practically constant conflict in policies and actions between the Soviet authorities on the one hand and the Governments of the three Western Allies on the other hand; hence the administration of Austria was most unsatisfactory in almost all respects. Moreover, the occupying Powers could not agree upon the terms for a permanent peace treaty between Austria and themselves. Even in 1952, seven years after the liberation, this harmful system of occupation still persisted, and hindered the economic recovery and the development of the State.

The natural resources of Austria are, because of its area and

situation, not great, though varied in character. An outstanding geographical fact is that three-quarters of the territory is mountainous, and the relief makes over 10 per cent. of the land quite unproductive. Of the remainder, about 60 per cent. consists of forests or natural pasture, and only 40 per cent. is under cultivation. The most productive area is that of the Danubian or Moravian lowlands in the Soviet Zone of the north-east.

These various forms of land utilization could not support the Austrian people, and there is the necessity of developing secondary industries based on mineral resources or water-power. Most of the minerals are in the mountainous Western Zone, and are chiefly worked in four groups of valleys where manufacturing has grown up. (See Fig. 82). (1) In and adjoining the Mur Valley are deposits of brown coal, iron ore and magnesite which support engineering, chemical and other works at Leoben, Bruck and Graz. (2) In valleys of streams entering the Danube near Linz, brown coal and other minerals give rise to a very varied group of industries. (3) Farther west in the neighbourhood of Salzburg salt, lead and zinc aid another set of manufacturing enterprises. (4) In the south is the Klagenfurt district with a further group of non-ferrous deposits and their works. Great hopes are placed on the development of these areas, and on the utilization of water-power which exists in abundance, and would be of the greatest value in the Austrian economy. A lack of credit has been temporarily relieved by American aid, but an assured political future for the State is a very serious handicap to Austria in these matters, together with other difficulties common to post-war recovery in many parts of the continent.

Meanwhile, in the first seven post-war years, all the north-eastern zone of Austria has been drawn within the sphere of the U.S.S.R., and its economic development has been associated closely with the Soviet Union and the Satellite States. For example, land tenures have been changed to the advantage of members of the Austrian Communist Party. Also the U.S.S.R. has confiscated industrial concerns and their equipment, and likewise the Danubian river shipping and wharves, on the ground that they were German, not Austrian, property. Further, the Soviet authorities have taken possession of the oil wells and refineries east of Vienna; part of the oil has been used to aid the industries of Vienna, but much has been exported

to the Satellite States. A peace treaty will determine to what extent this "Sovietization" may become permanent.

The Austrian State now has a population of 7 millions living on an area of 32,000 square miles; the pre-war net reproduction rate of less than unity, and the present difficult economic conditions, point to a reduction in the numbers of the Austrian people.

Germany.—In the earlier part of this book the physical and economic geography of the regions constituting what is now German territory has been described in considerable detail; this section has special reference to the political aspects of the State, past and present, and to the conditions of the German people.

Considered broadly, northern Germany consists of lowlands draining to the North Sea or the western Baltic Sea, and central and southern Germany comprises several groups of uplands reaching as far, or nearly as far, as the Alpine Region. The peoples of the lowlands are predominantly of the Nordic race and physical type; those of the uplands derive mainly from Alpine stocks. Since the frontier with Poland was moved westward, Slavonic racial traits and the Slav language are no longer represented in the population of Germany.

The connotation of the term "German State" has changed repeatedly through the centuries. In the Middle Ages there was a German Empire, but it fell to pieces as a result of the Napoleonic Wars, and about two-score small German States were but loosely united until 1866, when Austria left the confederation. In 1870 Prussia led the other German States in a victorious war with France, and in 1871 the King of Prussia was proclaimed Emperor of a new united Germany. It was at this time that France lost to Germany the province of Alsace and the greater part of Lorraine.

In the First World War the fortunes of Germany were reversed. After its defeat, a small area was ceded to Belgium, and the disputed territory of Alsace and Lorraine went back to France. The map in Fig. 76 of the Border-lands of Germany, France and Belgium shows that France also gained mineral deposits in the transferred areas. Moreover, the Saar area, with its valuable coalfield, had a change of status—one of a long series. It had been German, but after the First World War the French obtained the coal mines but not the territory itself; in 1935 a plebiscite resulted in a vote for union with Germany. Soon afterwards

came the Second World War, and following the German defeat France demanded in 1947 that the Saar should be included within the French Customs union. Five years later the Powers were still contending over the future of the Saar territory.

On its eastern frontiers Germany had suffered still greater losses. The changes of territory have been shown in Figs. 26 and 81 with the accompanying text, and the transfers of population have been discussed in the section on Poland in Chap. XXII.

Overseas possessions were acquired late by Germany and relatively soon lost. Island territories in the Pacific and much larger ones in Tropical Africa were gained between 1884 and the end of the 19th century, but after the First World War all were withdrawn from German rule and put under the supervision of the League of Nations. Mandates for the administration of the various areas were then assigned to the United Kingdom ; to Australia, New Zealand and the Union of South Africa ; to France and to Japan. After the Second World War, the United Nations took the place of the League of Nations and the mandated territories became trust territories. The trustee States are those indicated above, with the exception that Japan yielded place to the United States.

We must next deal with the present conditions of Germany, considering first its natural resources. The State now has a territory of 137,000 square miles ; this amounts to about three-quarters of its area before the Second World War. Its total agricultural productivity in relation to pre-war conditions is greater than this proportion might suggest, for the most fertile lands are in the retained west and south, while the north-east had generally smaller potentialities. In the matter of mineral wealth, i.e. the primary factor in the industrial development and therefore in the support of the dense population, it must be realized Germany still possesses the all-important Ruhr coal-fields, as well as that of Saxony, and widespread lignite deposits. The most important trade-routes, too, and the ports which in normal times have the greatest amount of traffic, lie within the new boundaries.

The value of these natural resources at the present time, however, has to be assessed in connection with the events during and after the war. As the mining and industrial areas were a main source of military power they were repeatedly bombed

by the air forces of the Allies, and the amount of damage was increased until they were overrun in the latter stages of the hostilities. River and sea ports were similarly attacked, and also land traffic in all parts of Germany. Berlin, as the final stronghold of the Government, suffered the greatest destruction in the last days of the war. The chaos resulting from all this devastation affected also the growing and transport of food ; hence millions of the German people lived for a time in ruined homes and suffered hunger, and millions, too, were involved in the migrations which will be referred to in a later paragraph. In sum, no other State in Europe had its economic life and its productivity so shattered at the end of the war.

Further dislocations and losses followed during the early part of the period of occupation. The Allied Governments insisted upon a twofold policy : (1) They should be secure from future German aggression ; (2) they, and particularly the U.S.S.R., should receive reparations for destruction wrought in the invasion of other lands—notably in the Ukraine and Southern Russia. Consequently the industries which had provided armaments and military equipment in the Ruhr and other areas, were to be taken under the control of the occupying Powers ; their vast organizations were to be disintegrated, and their actual plant was to be removed to other States which had suffered from military loss. Only enough of the industries was to be left to allow them to supply materials and goods for non-military purposes, and to maintain the population of Germany at a standard of living not higher than that of the average of the other States of Europe (excluding the United Kingdom and the U.S.S.R.). This policy was carried out in regard to the immediate breaking-up of the great coal, iron and steel organizations and the removal of much of their plant—a large part of which was sent to the U.S.S.R. Later, the future of the German industries was the subject of much negotiation, and recent developments will be referred to in the final section of this book on inter-State organizations.

Immediately after the war, Germany was divided by the Allied Powers into occupation zones ; in time, their policies became so markedly opposed, and the processes of economic recovery and political organization differed so greatly, that Germany was almost divided into two separate States, East and West. The Eastern Zone was the Soviet area which ex-

tended from the Oder-Neisse line to another which ran from Lübeck to the north-western corner of Bohemia. The Western Zone was that of the three other Powers ; Great Britain occupied the north-west, France the south-west, and the United States the remaining part of the south. The Eastern Zone included, broadly speaking, about 30 per cent. of the area, agricultural resources, industrial production and total population of Germany. Situated within it was Berlin, but this city was itself divided into distinct sectors administered by officers of the respective Powers. Both in the Eastern and the Western Zones, there were created areas for local government called *Länder* (Lands) which to some extent coincided with the old German States or Provinces.

In the Eastern Zone, a policy of Sovietization somewhat like that of much of East Central Europe was adopted. Communist organization, leadership and propaganda influenced the agricultural system, e.g. by the redistribution of the property of large landowners, and by the formation of a number of large State farms. Also they emphasized the importance of increasing industry, e.g. by a two-year and then a five-year plan devised and supervised by the central authority. Most industries were nationalized, and state-owned companies acquired nearly half of the productive capacity ; a considerable amount of the proceeds of these companies was sent to the U.S.S.R. Yet private ownership and management of much of the land and manufacturing plants are still acknowledged by the Government of the Eastern Zone. Similar political and economic policies were followed in the Soviet sector of Berlin.

The authorities in the three areas comprising the Western Zone did not follow the Soviet practice of removing both capital plant and current production as reparations, nor did they nationalize the German industries. Their methods of directing German economic recovery to some extent differed from one another, but in general, individual enterprise by German citizens and companies was given more scope and assistance. As Berlin itself was divided into east and west sectors, in which the strongly contrasted methods were adopted, economic rehabilitation in the capital was retarded and its people were subjected to special difficulties.

Definite information is lacking about the progress of recovery in the Soviet areas. For Western Germany the general indus-

trial situation may be gathered from a comparison of coal and crude steel, as fundamental factors, produced in three selected years; the amounts are expressed in million metric tons* :

1938 (pre-war)	Coal = 137 ; Steel = 18
1946 (immediate post-war)	..	Coal = 54 ; Steel = 3
1951 (5 years later)	Coal = 119 ; Steel = 14

These figures must be considered in connection with the destruction and dismantlement of the plant, and the initial handicaps in the supply of capital and labour. Recovery in the German economy was aided by the British and American authorities, but it depended mainly on the diligence and capacity of the German workers in general.

Agricultural and pastoral production was less of a problem, but in view of the increase of population, efforts have been made to intensify cultivation. In the Western Zone, small estates and peasant proprietorship are the common forms of tenure.

Trade returns show that five years after the war Germany had again become an exporter of finished and semi-finished manufactured goods, and an importer of food-stuffs and raw materials, but comparisons with pre-war conditions are vitiated by changes in general world prices and by inflation in Germany. The greatest amount of commerce was now carried on with the U.S.A. (mainly in imports) and with the immediate neighbours of Western Germany : Netherlands, Belgium-Luxemburg and (for exports) France. At this period little trade had taken place between the Eastern and Western Zones.

Political developments within Germany have been increasingly affected by the growth of antagonism between the Communist Powers and those of the "Western World." While the Eastern Zone was drawn into the Soviet sphere and a "Government of the People's Republic" was set up, the Western Zone was encouraged and assisted to establish a Government of its own on democratic lines, as the term is interpreted in the U.S.A., Great Britain and France.

A Constituent Assembly met in Bonn in 1948 and in the following year the German Federal Republic came into being. It is at present formed of nine Länder (sometimes referred to as "States"), and provision is made for the future admission of

* Published by the Department of Economic Affairs (U.N.), for the "Economic Survey of Europe in 1951."

others now in the Eastern Zone. The Federal Republic is governed by a President, a Chancellor (corresponding to Prime Minister) assisted by other Ministers, a Diet elected by universal suffrage, and a Council consisting of members of the Governments of the Länder. The Länder have specified powers within their respective territories, but the Government of the Federal Republic is responsible for matters affecting the State as a whole.

Future relations between the Eastern and Western Zones, including their possible unification, appear to depend both upon the growth of opinion in Germany itself, and also upon developments which may occur between the two groups of States whose opposition is now expressed by the partition between the two sections of the German people. That opposition is also largely responsible for the failure to conclude a comprehensive peace treaty seven years after the end of hostilities.

At this same period, the greatest social problem was that of millions of people known as "refugees" or "displaced persons", a large proportion of whom were still in poverty and without work and homes, for they had fled, or had been forced, into a stricken land in no condition to receive them. The majority came from the adjoining States of East Central Europe, especially Poland and Czechoslovakia. In the last stages of the war, a great flood of people moved in front of the advancing Russian armies into what is now the Soviet Zone or the adjoining parts of the Western Zone. Many of those who entered the Soviet Zone again migrated westward; this movement continued, illegally, for years, yet probably about $4\frac{1}{2}$ million refugees now remain in the Eastern Zone. The greater number, about $9\frac{1}{2}$ millions, entered Western Germany where about 8 millions (one-sixth of the population) still have identity cards as refugees; the Federal Government has had to form a special Ministry to endeavour to absorb them into the economy and social life of the German people. A six-year plan has now been made for housing them, training them for suitable employment, organizing them to carry on small industries or businesses, and giving them work on the reclamation and cultivation of moor, heathland or abandoned forests.

Among the rest of the population there is still a lack of adjustment in industry, which results in unemployment, and there is still a tendency for a gap to develop between wages and commodity prices. Hence the German people in general have had

to a considerable extent to reduce their standard of living which before the war ranked high among the countries of Europe.

With the influx of refugees to a State with diminished territory, Germany as a whole has to support a population of over 66 million people on an area of 137,000 square miles ; this means an average density of nearly 500 persons per square mile, and above 500 in the Federal Republic—figures exceeded on the Continent only in Belgium and the Netherlands. It seems probable that the total number of the German people will tend to decrease, as for some time before the Second World War the net reproduction rate had fallen to less than the replacement rate, and a change in this respect is not encouraged by present social and economic conditions.

Addendum.—In May 1952 the Chancellor of the Federal Republic and the Foreign Ministers of France, Great Britain and the U.S.A. signed conventions which ended the occupation of the Western Zones and restored sovereignty to the Federal Republic ; it was not a " peace treaty," for this would still have to wait for the unification of Western and Eastern Germany. By the conventions, the previous authority of the Commissioners of the Western Powers in their respective Zones was now repealed and, in the words used at the signing of the documents, the Federal Republic of Germany was welcomed back to the community of nations. Among other provisions it was agreed that the three Powers were to facilitate Federal aid to Berlin and the continuation of Berlin's representation in the Federal Parliament. Also, in view of the extremely difficult relations between the four signatories on the one hand and the Soviet authorities on the other, the three Powers reserved the right to station forces in the territory of the Federal Government in order to provide security against possible external attack or serious internal disorder. The military sections of the contracts, however, are to be read in connection with the establishment of the European Defence Community which was formally brought into existence at the same time and of which the Federal Government is a member. (The constitution and powers of the E.D.C. are summarized in a later paragraph of this Chapter.) The three Powers also retained the right to deal with matters concerning the unification of Germany and the drawing up of a peace treaty with an All-German State.

The authorities of the Soviet Zone immediately responded by

creating an armed belt of "No man's land" between the territories, and by further restricting communication and commerce between East and West both in Germany as a whole and also in Berlin itself.

Inter-State Organizations.—Most of the States of Europe have become members of the United Nations and the associated organizations, but to deal with these is outside the scope of this volume. Reference has been made, however, to the Cominform; this is an inter-State organization established by the Communist Powers, mostly in Europe although the U.S.S.R. extends into Asia. In recent years several of the western States of the continent have combined with one or more others for mutual co-operation in certain matters; in some instances this co-operation can be effected simply by an agreement between the States, but in others it has needed the setting-up of special bodies which have defined powers to act within the territories of the States concerned.

Benelux.—The former type of association is illustrated by the Customs Union agreed upon in 1922 by Belgium and Luxemburg, and by a recent attempt to extend this to include the Netherlands, the whole union being given the name "Benelux" formed by the first letters of the participating States. The intention was announced by the Governments of these States in 1944, and at first it appeared to be a fairly simple matter to allow goods to pass freely from one member to another, and for them to draw up a single set of customs duties to regulate trade between the union and other States. Practical difficulties occurred, however, when definite schemes were proposed. For example, if a common tariff on imported goods took the place of two tariffs on different scales, the change would necessitate an increase in the duty on some particular commodities entering one of the States. That would tend to protect further the manufacturers of those commodities in that State and thus give them an advantage over their competitors in the other State. Similarly, revision of trade regulations and transit charges would cause changes in the commerce passing through the rival ports of Antwerp and Rotterdam.

A further proposal to bring about full economic union between the two States, by such measures as making their currencies interchangeable and equalizing rates of interest on loans, has raised most serious financial problems. Because of all these

difficulties the creation of a comprehensive Benelux union has not yet been achieved.

The European Coal and Steel Community.—This association is one of the type which acts through an organization set up by a number of States to control or direct certain specified actions of the subjects of the participating States, and thus to take over certain functions which would otherwise be exercised by the States themselves. In this case the actions are those of the producers of coal and steel in France, Belgium, Luxembourg, the Netherlands, Western Germany and Italy. (The scheme is also called the Schuman plan because that French statesman proposed it in 1950; a treaty embodying the final scheme was signed in the following year.)

The aim of the European Coal and Steel Community is "to substitute for age-long rivalries [of the six States] a fusion of their essential interests," and thus to remove a danger to friendly relations; it is also intended to facilitate production and consumption of these basic commodities, and to develop employment and improve the standard of living.

The means by which these aims are to be reached include, primarily, the creation of a single market—a free-trade area—within the combined territories, in order that co-operation may take the place of competition. The Community of producers is supervised by a "High Authority" appointed by the six States, and, in order that it shall be impartial, its actions are subject to criticism by representatives of the Governments of the States. The High Authority has to ensure that there shall be freedom of purchase, sale and transport of the commodities from any part of the territories to another, with no discrimination as to prices or terms, etc. It may also aid production by giving advice and even loans where required. Moreover, it has to keep watch on the dealings between the Community and the outside world, with a view to fair dealing and the development of international trade; to this end it may fix maximum and minimum export prices.

At the present time the scheme has not reached the stage of actual operation, and Great Britain has not entered into the Coal and Steel Community.

European Defence Community.—To provide mutual aid against aggression the North Atlantic Treaty Organization has been constituted, including the United States, Canada, the

United Kingdom and a number of States in Western and Southern Europe. Within this framework the European Defence Community has been formed by France, Belgium, Luxemburg, the Netherlands, Western Germany and Italy, to co-ordinate and, as far as possible, unify their contributions in men and materials to the wider organization. In May 1952 a draft treaty was signed by the Governments of these six States, under which a common European Defence Ministry is to be established. This Ministry will consist of a number of commissioners whose duty will be to arrange for and organize the land, sea and air forces which the Governments have agreed upon to be provided by each State, and for carrying out co-ordinated systems of training and supply of equipment. The commissioners will also prepare a common budget for the financial contributions of the States. They will work under the supervision of a Council of Ministers representing the member States. [Two notes must be added. (1) The E.D.C. deals only with matters of supply ; operations of the armed forces are in the power of the North Atlantic Treaty Organization (N.A.T.O.). (2) As this book goes to press, the " Bonn Agreement " of May 1952 with the Federal Government of Germany and the " Paris Agreement " about the E.D.C. still await ratification by some Parliaments of the respective States.]

The Council of Europe.—This organization was set up in 1949 by the Foreign Ministers of States in Northern, Western and Southern Europe, and fourteen States now participate, including the United Kingdom. The aim was " to achieve a greater unity between its members . . . by discussion of questions of common concern and by agreements and common action in economic, social, scientific, legal and administrative matters. . . . Matters relating to common defence do not fall within the scope of the Council of Europe."

The Council has two organs. The first is the Committee of Ministers, which consists of the Foreign Ministers of the States ; its function is to pass resolutions, either on its own initiative or, if it approves, on recommendations from the second organ of the Council. This is the Consultative Assembly, a much larger body composed of representatives appointed by the member States as they desire, but limited to a number proportionate to their populations. The Assembly meets at Strasbourg, normally once a year.

It must be noted that the Council of Europe cannot commit the participating States to any course of action, nor has it any executive power. The Assembly is merely "Consultative," and the Committee of Ministers can only refer its resolutions to their Governments for consideration.

At the present time, therefore, its function is mainly to influence public opinion in the participating States, to discuss and clarify the issues which are raised, and to bring these to the attention of the Governments concerned with a view to their action. Some members wish for an extension of its powers, but even if this does not occur the value of the Council of Europe may be very considerable in developing and guiding the thought and feelings of people—the ultimate factors in international relationships.

APPENDIX I

TIME SEQUENCE OF GEOLOGICAL PERIODS
AND EARTH-MOVEMENTS REFERRED TO IN THE TEXT

Eräs	Periods	Earth-movements
Quaternary	Recent Pleistocene (Ice Age)	
Cainozoic or Tertiary	Pliocene Miocene Oligocene Eocene	← Alpine
	Cretaceous { Upper Lower	
Mesozoic or Secondary	Jurassic { Upper Middle Lias Triassic { Keuper Muschelkalk Bunter	
	Permian Carboniferous	← Hercynian
Palæozoic	Devonian Silurian Ordovician Cambrian	← Caledonian
Archæan.	Pre-Cambrian	← Charnian

APPENDIX II

LIST OF BOOKS

- P. Camena d'Almeida : *Etats de la Baltique ; Russie* (Colin, 1932).
- R. R. Betts : *Central and South East Europe, 1945-1948* (R. Inst. of International Affairs, 1950).
- P. Vidal de la Blache : *Tableau de la Géographie de la France* (Lavissee, 1900).
- R. Blanchard and R. E. Crist : *A Geography of Europe* (Methuen, 1934).
- I. Bowman : *The New World : Problems in Political Geography* [all continents] (Harrap, 1928).
- V. Chataigneau et J. Sion : *Pays Balkaniques* (Colin, 1934).
- G. A. J. Cole : *The Growth of Europe* [Geological] (Thornton Butterworth, 1914).
- L. W. Collet : *The Structure of the Alps* (London, 1936).
- G. B. Cressey : *The Basis of Soviet Strength* (Harrap, 1946).
- J. Cvijic : *La Péninsule Balkanique* (Colin, 1918).
- A. Demangeon : *Belgique ; Pays-Bas ; Luxembourg* (Colin, 1927).
- A. Demangeon : *France économique et humaine* (Colin : Partie I 1946, Partie II 1948).
- W. G. East : *An Historical Geography of Europe* (Methuen, 1935).
- W. Fitzgerald : *The New Europe ; An Introduction to its Political Geography* (Methuen, 1945).
- H. J. Fleure : *The Peoples of Europe* (Oxford Press, 1922).
- J. Früh : *Geographie der Schweiz* (Zollikofer, 1930-36).
- P. George : *Géographie économique et sociale de la France* (Editions Sociales Internationales, 1938).
- K. Gibberd : *Soviet Russia* (R. Inst. of International Affairs, 1946).
- J. Gottmann : *Geography of Europe* (Holt & Co., 1950).
- G. D. B. Gray : *Soviet Lands ; the Country, its People and their Work* (Black, 1947).
- J. S. Gregory and D. W. Shave : *The U.S.S.R.* (Harrap, 1944).
- H. F. K. Günther : *Racial Elements of European History* (Methuen, 1927).
- J. S. Huxley and A. C. Haddon : *We Europeans* (Cape, 1935).
- O. Jonasson : *Agricultural Regions of Europe* [in "Economic Geography"] (Clark University (U.S.A.), 1925 and 1926).
- G. Jorre : *The Soviet Union ; the land and its People* [Eng. Trans.] (Longmans, 1950).
- W. G. Kendrew : *The Climates of the Continents* (Oxford Press, 1937).
- E. M. Kulischer : *Europe on the Move ; Population Changes, 1917-47* (Cumberlege, London, 1948).

- E. de Martonne : *Les Régions Géographiques de la France* (Flammarion, 1921).
- E. de Martonne : *Les Alpes* (Colin, 1926).
- E. de Martonne : *Europe Centrale* (Colin, 1931).
- A. E. Moodie : *The Italo-Yugoslav Boundary* (Philip, 1945).
- A. E. Moodie : *Geography and Politics* (Hutchinson, 1949).
- M. I. Newbigin : *Geographical Aspects of Balkan Problems* (Constable, 1915).
- M. I. Newbigin and D. J. Harrison : *Southern Europe* (Methuen, 1949).
- H. Ormsby and F. J. Monkhouse : *France* (Methuen, 1949).
- N. J. G. Pounds : *Historical and Political Geography of Europe* (Harrap, 1947).
- G. W. Robinson : *Soils* (Murby, 1936).
- R. Inst. of International Affairs : *Scandinavian States and Finland* (Chatham House, 1951).
- H. Schwartz : *Russia's Soviet Economy* (Cape, 1951).
- T. Shabad : *Geography of the U.S.S.R. A Regional Survey* (Oxford Press, 1951).
- J. Sion : *Italie* (Colin, 1934).
- M. Sorre : *Espagne ; Portugal* (Colin, 1934).
- R. H. Steinberg (Editor) : *Statesman's Year Book* (Macmillan, Annual).
- S. van Valkenburg and E. Huntington : *Europe* (Wiley, 1948).
- D. Warriner : *Revolution [Economic] in Eastern Europe* (Turnstile Press, 1950).
- Various Writers : *Economic Geography of the U.S.S.R.* (Macmillan, 1949).
- E. G. Woods : *The Baltic Region* (Methuen, 1932).
- M. Zimmerman : *Etats Scandinaves* (Colin, 1933).

There are numerous articles on detailed subjects, published in the journals of the geographical societies of Britain, the United States, and continental countries ; also publications are issued annually, or at intervals, by British and other Governments and by the United Nations Organization and its Agencies (e.g. UNESCO), giving current information particularly on economic matters.

At the present time, when important changes may be too rapid to be treated in the above-mentioned sources, use may be made of articles giving trustworthy factual information in publications which appear more frequently. Among these are the monthly issues of *The World Today* (Royal Institute of International Affairs) and *The British Survey* (British Society for International Understanding) ; the weekly issues of *The Economist* and *The Listener* ; the daily issues of *The Times*, and *The Manchester Guardian*.

INDEX OF GEOGRAPHICAL NAMES

Aachen, 114
Aar, R., 179
Abo, 278
Adda, R., 183
Adige, R., 183, 184, 192, 193, 228, 229
Adria, 228
Adrianople (*see* Edirne)
Adriatic Sea, 16, 215
Ægean Sea and Is., 16, 212, 223, 228, 327, 330
Æolian Is., 237
Aigues Mortes, 152
Ajaccio, 238
Alais, 149
Aland Is., 277, 296
Alban Hills, 233
Albania, 85, 88, 212, 219, 220, 327, 375, 376
Albanian Gap, 220, 372
Alès, 149
Alfeld, 208
Algarve, 248, 321
Algeciras, 253
Algeria, 310
Alicante, 255
Aller, R., 122
Allier, R. and V., 143-146
Almaden, 250
Almeria, 255
Alpine Foldings, 14-17, 182
Alpine Foreland, 177-181
Alps, Mts., 14-16, 74, 78, 83, 182-196
Alsace, 85, 86, 94, 167, 306, 307, 383
Alto Adige, 324
Altona, 103
Amsterdam, 104, 300, 301
Amu, R., 339, 345
Andalusian Cordillera, 240, 241, 252, 253, 255
Andalusian Trough, 240, 241, 251, 252, 316, 319
Angers, 135
Ankara, 328
Antwerp, 105, 303, 305, 390
Apennine Mts., 14, 226-236, 325
Apulia, 234, 235, 236
Aquitaine Basin, 139-142
Aragon, 316
Arc, R., 184
Archangel (Arkangelsk), 26, 275
Arctic Region, 64
Ardenne, 157, 303, 306
Argonne, 132, 169
Arid Caspian Depression, 68
Arlberg Pass, 193
Arles, 152, 153
Armagnac, 141, 142
Armenia, 94, 288, 336
Arno, R., 233
Artois, 132, 133
Arve, R., 186
Assomonte, Mt., 236
Asteri 233

Asti, 229
Astrakhan, 26, 288
Asturias, 245
Athens, 26, 215, 224, 329, 330
Aubrac, 145
Augsburg, 166, 180
Austria, 93-95, 182-196, 206, 380-383
Austria-Hungary, Dual Monarchy, 93-95, 206, 216, 371, 372, 381
Auvergne, 144, 145
Avignon, 151, 153
Azerbaijan, 94, 336
Bakony Forest (Bakonyerdo), 197, 205
Baku, 288, 346
Balaton L., 205
Balearic Is., 85, 241, 255
Balkan Mts., 14, 203, 213, 220, 221
Balkan Peninsula, 16, 57, 79, 81, 82, 83, 88, 212-225, 327-328
Baltic Entry-lands, 117, 119
Baltic Plateaus, 117-121
Baltic Sea, 116
Baltic Shield, 7-9, 262, 266, 273, 274
Baltic States (*see also* Estonia, Latvia and Lithuania), 94-95, 270, 278
Bamberg, 166
Banat Lowland, 208
Banat Mts., 197, 202, 203
Baragan Steppe, 210
Barcelona, 253
Bari, 235
Barmen, 113
Basel (Bâle), 104, 160, 179
Basque Region, 82, 245, 315, 318
Batumi, 289
Bavarian Foothills, 178-180
Bavarian Forest, 171-173
Bavarian Plateau, 178, 180
Beauce, 127
Belfort, 151, 176
Belgium, 61, 79, 85, 86, 94, 96-115, 169, 303-305
Belgrade (Beograd), 209, 213, 218, 372, 373, 390, 391, 392
Benelux States, 390
Berdiansk, 286
Bergen, 26, 259
Bergslagen, 266
Berici Hills, 229
Berlin, 26, 122, 385, 386, 389
Bern, 179
Bernese Alps, 186
Berry, 134, 135
Besançon, 177
Beskids Mts., 197-201
Bessarabia, 95, 367
Béthune, 115
Betic (*see* Andalusian)
Biel, L., 179
Bihor (Bihar) Mts., 197, 203
Bilbao, 245

INDEX

- Biscay, Bay, 139
 Black Forest Mts., 9, 164, 165
 Black Mtn. (France), 144, 148
 Black Sea, 16, 287
 Black Sea Coast-lands, 222, 287, 368, 370
 Blanc Nez., C., 126
 Blois, 135
 Bocchetta Pass, 231
 Bochum, 114
 Bodö, 26
 Bohemia, 171, 206, 359, 360
 Bohemian Diamond, 10, 171, 172
 Bohemian Forest, 171-173
 Bohemian Massif, 170-176
 Bohemian-Moravian Plateau, 171, 176
 Bologna, 229
 Bolzano, 184, 193
 Bonn, 111, 387
 Bordeaux, 26, 139, 141
 Boreal Forest Region, 64-66
 Bosnia, 372, 373
 Bosphorus, Strait, 213, 222, 328, 370
 Bothnian Coasts, 262, 263, 274, 275
 Boulogne, 133
 Boulonnais, 133
 Bozen (*see* Bolzano)
 Braila, 211
 Brasov, 201
 Bratislava, 200, 360
 Bray, Pays de, 133
 Bremen, 103
 Brenner Pass, 166, 184, 191, 332
 Brenta, R., 183
 Breslau (*see* Wroclaw)
 Brest, 26, 135, 137, 138
 Breton Peninsula, 9, 135-138, 305, 308
 Brie, 127
 Briey, 168
 Brindisi, 235
 British Isles, 2, 9, 12, 41, 59, 60, 61, 71, 78, 79, 82, 83
 Brittany (*see* Breton Peninsula)
 Brno, 206
 Bruck, 184, 382
 Bruges, 105
 Brunsbüttel, 103
 Brunswick, 104, 107
 Brussels, 26, 112, 303
 Bucharest (Bucuresti), 26, 199, 210
 Budapest, 26, 199, 205, 207, 209
 Bug, R. (Poland), 122
 Bug, R. (Ukraine), 287
 Bukovina, 201
 Bulgaria, 81, 88, 212-215, 221-223, 327, 369, 370
 Burgas, 222
 Burgos, 249
 Burgundian Gate, 151, 176
 Burgundy, 150
 Byelorussia (*see* White Russia)
 Bytom, 124
 Byzantium, *see* Istanbul
 Caen, 134
 Cagliari, 238
 Calabria, 235, 236
 Calais, 98, 107
 Camargue, 152, 311
 Campidano, 237
 Campine, 106, 107, 110, 303
 Canfranc Tunnel, 247
 Cannes, 153
 Cantabrian Mts., 14, 241, 242, 245
 Cantal, 145
 Carcassonne, 141, 142
 Carpathian Mts., 14, 197-205, 207
 Carpatho-Ukraine (*see also* Ruthenia), 95
 Carrara, 232
 Cartagena, 255
 Caspian Lowland, 20, 40, 68, 287, 288, 345
 Castile, 83, 240, 242, 245, 248-251, 316
 Catalonia, 85, 253, 315, 318
 Catalanian Mts., 241, 251, 253
 Catania, 237
 Caucasus Mts., 14, 87, 287-288
 Causses, 144, 146-148
 Central Plateau (France), 9, 10, 11, 142-149
 Cernavoda, 211
 Certe, 152
 Cevennes, Mts., 143, 144, 148, 149
 Champagne, 131, 132
 Charente, 140, 141
 Charleroi, 114
 Chaux-de-Fonds, 177
 Chelyabinsk, 276
 Chemnitz, 175
 Cherbourg, 138
 Chorzow, 124
 Cieszyn, 124
 Cintra Hills, 242, 247, 248
 Civitavecchia, 234
 Clermont-Ferrand, 146
 Cluj, 202
 Coblenz, 160
 Cognac, 140
 Coiron, Mt., 149, 151
 Colmar, 161
 Cologne (Köln), 110, 111
 Como, L., 183, 184
 Constance, L., 178
 Constanta (Constantza), 210, 211, 368
 Constantinople (*see* Istanbul)
 Copenhagen, 120, 298, 299
 Cordoba, 251, 252
 Corinth, 224
 Corsica, 237, 238, 310
 Corunna, 244
 Côte d'Or, 150
 Cotentin, Pen., 138
 Courtrai, 112
 Cracow (*see* Krakow)
 Crau, 152
 Crefeld, 111
 Cremona, 228
 Crete (*see* Krete)
 Creusot, 149
 Crimea, 14, 287, 345
 Croatia, 372, 373
 Croatian-Serbian Region, 217-218
 Croatian-Slavonian Upland, 197, 205
 Cyprus, 324
 Czechoslovakia, 61, 86, 93, 94, 95, 124, 170-172, 195-201, 205-206, 359-361, 363
 Dal, R., 266
 Dalmatia, 212, 215-217
 Dannemora, 266
 Danube, R., 181, 203, 205-211, 218, 359, 368, 382

INDEX

Danubian Plains, 86, 362
 Danzig (*see* Gdansk)
 Dardanelles, 213, 327
 Debrecen, 209
 Denain, 115
 Denia, 254
 Denmark, 94, 96, 120, 269, 292, 297-299
 Deutsches Reich (*see* Germany)
 Dieppe, 134
 Dijon, 151
 Dinaric Alps (Dinarske Planina), 14, 212, 215
 Djakovica (Diakova), 220
 Dneiper, R., and Region, 18, 270, 279, 283, 284, 285, 286, 345
 Dniepropetrovsk, 286
 Dnieprostoy, 285
 Dnieprozerzhinsk, 286
 Dobrogea, 209-211
 Dodecanese Is., 330
 Dolomites, 192
 Dombes, 150
 Don, R., 286, 287, 345
 "Donbas," 286
 Donetz Area, 10, 270, 286
 Donzère, 310
 Dora Baltea, 184, 191, 226
 Dora Riparia, 184, 185
 Dordogne, R., 139, 147
 Dore, Mt., 145
 Dortmund, 114
 Dortmund-Ems Canal, 103, 114
 Douai, 115
 Douarnenez, 137
 Doubs, R., 177
 Douro Plateau, 240, 243, 248
 Douro, R., 239, 240, 247, 248
 Dovre Fjeld, 3, 261, 294
 Drac, R., 183, 191, 194
 Drava, R., 183, 196, 207
 Dresden, 175
 Drin, R., 220
 Duisberg, 114
 Dunkirk (Dunkerque), 98, 106
 Durance, R., 152, 194
 Durres, 219
 Düsseldorf, 111
 Dvina (Daugava), R. (Latvia), 278
 Dvina, R. (Russia), 275

East Alpine Foothills, 203
 East Danubian Plains, 207-209
 East Prussia, 86, 94-95, 121, 354
 East Rhine Scarp-lands, 164-167
 Ebro, R., 241, 251, 253
 Ebro Trough, 241, 250, 251
 Edirne, 213, 222
 Eger (*see* Ohre)
 Eifel, 158
 Eisack, R. (*see* Isarco)
 Eisenerz Mts., 192, 196
 Elba, 232
 Elbe, R., 101, 103, 104, 106, 122, 171, 175
 Elbe-Trave Canal, 103
 Elberfeld, 113
 Elbruz, Mt., 288
 Etche, 254, 255
 Elster, R., 124

Emba, 276, 288
 Emba, R., 287
 Emden, 103
 Ems, R., 101, 103, 106
 Engadine, 184
 Enns, R., 183, 193
 Epervay, 131
 Erz Gebirge, 11, 175
 Esbjerg, 99
 Essen, 114
 Estonia, 80, 86, 87, 94-95, 278, 279, 336
 Etna, Mt., 236, 237
 Euganean Hills, 229
 Evvoia (Eubœa), 224
 Falun, 266
 Farmed Forest Region, 66-67
 Faroe Is., 3, 311
 Feldberg, 164
 Ferrol, 245
 Finland, 7, 8, 59, 65, 80, 81, 86, 94, 267, 270-275, 277, 278, 292, 296-297
 Fiume (*see* Rijeka)
 Fjeld, 44-45
 Flanders, 111
 Florence, 229, 233
 Flushing, 99
 Fontainebleau, 130
 Forez, 144, 146
 France, 7, 12, 50, 61, 78, 79, 82, 85, 94, 96-115, 126-154, 160-161, 167-169, 176-177, 178, 182-196, 237-238, 305-313, 391, 392
 Franconian Alb, 166
 Frankfurt-on-Main, 163
 Freiburg, 163
 French Union, 310
 Frisian Is., 99
 Fulda, R., 170

Galata, 223
 Galati (Galatz), 211
 Galicia (Poland), 125
 Galicia (Spain), 83, 239, 244, 245, 315-316
 Gandia, 254
 Garonne, R. and V., 139, 141
 Gascony, Dunes, 139
 Gâtine, 136
 Gavarnie, Cirque, 246, 247
 Gävle, 266
 Gdansk (Danzig), 121
 Gdynia, 121
 Geest, 96-110
 Gellivara, 263
 Gelsenkirchen, 114
 Geneva, 178, 179
 Génissiat, 310
 Genoa, 26, 195, 230-232
 Georgia, 94, 336
 Germany, 60, 61, 79, 85, 86, 94-95, 96-115, 116-125, 155-181, 182-196, 203-206, 354, 356, 383-390, 391, 392
 Ghent, 105
 Gibraltar, 253, 331
 Gibraltar, Strait, 28
 Gijon, 245
 Giovi Pass, 231
 Gironde, R., 139

INDEX

- Giurgiu, 210
 Glin, 7, 262
 Glittertind, Mt., 261
 Gliwice, 124
 Glommen, R. and V., 259
 Golden Horn, 222
 Gorki, 281, 282
 Görlitz, 173
 Göta, R., 267
 Götaland, 264, 267, 268
 Göteborg, 267
 Granada, 252
 Gran Sasso d'Italia, 232
 Graz, 203, 382
 Great St. Bernard Pass, 184
 Greece, 50, 85, 212-216, 223-225, 327, 328-331
 Grenoble, 194
 Grésivaudan, 183, 193
 "Grimsel Lake," 379
 Grozny, 287, 288
 Guadalavir, R., 250, 253
 Guadalquivir, R., 241, 251, 252
 Guadiana, R., 239, 240
 Gudbrandsdal, 259, 261
- Haarlem, 100
 Hague, The, 98, 101, 300
 Halle, 123, 124
 Hamburg, 103
 Hammerfest, 261
 Hanover, 104, 107
 Haparanda, 26
 Harburg, 103
 Hardanger Fjeld, 261
 Hardt Upland, 167
 Harz Foreland, 169
 Harz Mts., 9, 154, 169
 Havel, R., 103
 Havre, 134
 Heidelberg, 163
 Helsinki (Helsingfors), 278, 297
 Herculeaneum, 235
 Hercynian Uplands, 9-11
 Herzegovina, 372, 373
 Hinter Rhine, R., 184
 Hjelmar, L., 264-266
 Holland (*see* Netherlands)
 Hook of Holland, 99, 104
 Hornad (Hernad), R., 200, 205
 Hron, R., 199
 Huelva, 250
 Hungarian Basins (Upper and Lower), 81, 197, 199, 206-209, 372
 Hungarian Ore Mts. (*see* Slovakian Ore Mts.)
 Hungary, 87, 93, 94, 197-200, 205-209, 216, 360, 362-366
 Hunsrück, 157
- Iberian Highlands, 242, 250-251
 Iberian Peninsula, 68, 71, 79, 81, 83, 85, 239-255, 314-320
 Iceland, 3, 58, 268, 269
 Idria, 195
 IJssel, R., 99, 106
 Ile de France, 127-131
 Ile de la Cité, 130
- Ill, R., 161
 Ilmen, L., 279
 Imatra Falls, 275
 Inn, R., 183, 184, 193
 Innsbruck, 184, 193
 Ionian Sea and Is., 327, 330
 Ipel, R. and V., 205, 317
 Irkubsk, 338
 Iron Gate, 203
 Isar, R., 180
 Isarco, R., 183, 184, 193
 Isère, R., 183, 184, 194
 Iskar, R., 221
 Istanbul (Constantinople), 81, 88, 213, 222-223, 327, 328
 Istria, 216, 217
 Italian Lakes, 195
 Italy, 14, 50, 76, 79, 83, 86, 182-196, 216, 226-238, 322-327, 391, 392
- Jalon, R., 250, 251
 Jämtland, 263
 Jerez, 252
 Jiu, R., 202
 Jönköping, 268
 Josteldals Brae, 261
 Jotun Fjeld, 3
 Jucar, R., 250, 253
 Jura Mts., 14, 176-177, 306
 Jutland, 99, 107, 117-120
- Kakhova, 345
 Kaiserstuhl, 163
 Kaliningrad, 26, 121
 Kaluga, 282
 Kama, R., 275, 276
 Karaganda, 338
 Karelia, 80, 86, 273, 274, 296
 Karelo-Finnish Republic, 336
 Karelo Vary (Karlsbad), 172
 Karlsruhe, 26, 160, 161, 166
 Karst Plateaus, 148, 212, 216, 217, 219
 Kassa (Kosice), 205
 Katowice, 124
 Kaunas, 122
 Kazakh Republic, 336
 Kazan, 282
 Kempenland (*see* Campine)
 Kerch, 286
 Kharkof, 286
 Kiel, 103, 120
 Kiev, 94, 283, 284, 335
 Kiölen, Hds., 261
 Kirghiz Republic, 336, 338
 Kirkenes, 294
 Kiruna, 263
 Klagenfurt, 183, 196, 381, 382
 Klaipeda, 75, 122
 Kola Bay and Peninsula, 271, 273
 Komsomolsk, 338
 Königsberg (*see* Kaliningrad)
 Kosovo, 220, 372, 373
 Kovno, 122
 Kraichgau, 166
 Krakow, 125
 Krasnovodsk, 345
 Krete (Crete or Kriti), 83, 212, 224, 329-
 Krivoi Rog, 286

INDEX

Krolewska Huta (*see* Chorzow)

Kronstadt, 273

Kuibyshev, 283, 345

Kura, R., 288

Kursk, 283

"Kusbas" (Kusnetsk), 338

Labe, R. and V., 171, 172

La Coruña, 244

Ladoga, L., 274, 297

La Futa Pass, 229

Lahn, R., 158

Landes, 139

Langres Plateau, 148, 149, 151, 169

Languedoc, 152

Lappland, 263

Latvia, 81, 86, 94-95, 278, 279, 336

Lausanne, 179

Lech, R., 180

Leghorn (*see* Livorna)

Leine, R., 104

Leipzig, 123, 124

Leitha, R., 184

Lek, R., 104, 106, 109

Leningrad, 270, 273, 274, 279, 280

Lens, 115

Leoben, 382

Leon, 245

Libau, 278

Liège, 105, 114, 303

Liepaja, 278

Lille, 112

Limagne, 143, 146

Lim Fjord, 101

Limoges, 145

Limousin, 144-145

Linares, 250

Linz, 382

Lipari Is., 237

Lisbon, 248

Lithuania, 81, 86, 94-95, 122, 278, 279, 336

Little St. Bernard Pass, 184

Livorna, 233

Ljubljana, 203, 373

Lodz, 123

Lofoten Is., 260

Loing, R., 131

Loire, R. and V., 131, 134, 135, 136, 138, 143-146

Lombardy Plain (*see* North Italian Plain)

London, 26

Longwy, 169

Lorca, 255

Lorraine, 85, 86, 94, 167, 306, 307, 383

Lorraine, Côtes de, 132, 165, 168-169

Lorraine Plateau, 165, 167, 168

Lot, R., 147

Lötschberg Tunnel, 187

Lübeck, 103, 120

Lucerne, L., 377

Ludwig's Canal, 156, 166

Ludwigshaven, 161

Lüneberg Heath, 122

Luxemburg, 157, 169, 305, 390, 391, 392

Lwow, 125

Lyons, 26, 149, 150, 151

Lys, R., 97, 105

Łysa Góra Uplands, 10, 124, 125

Maastricht, 105, 111, 114, 301, 340

Macedonia, 212, 215, 220, 327, 371, 372, 373

Madrid, 26, 244, 250, 316

Magdeburg, 104, 106, 122, 123

Maggiore, Lake, 184, 195

Magna Gracia, 236

Magnitogorsk, 276, 277

Maikop, 288

Main, R., 161, 163, 165

Maine, 135, 136

Mainz, 161

Majorca, 255

Makeyevka, 286

Malaga, 255

Mälär, L., 8, 266, 267

Malmédy, 313

Malmö, 120

Maltese Is., 237, 331

Mannheim, 161

Mazanarès, R., 250

Maritsa, R., 213, 222

Mariupol (*see* Zhdanov)

Marmara, Sea and Region, 213, 216, 222, 223, 327

Marne, R., 127-131, 168

Marne-Rhine Canal, 161, 163

Maros, R. (*see* Mures, R.)

Marseilles, 26, 151, 153

Massa, 232

Massif Central (*see* Central Plateau)

Matra Mts., 197, 205

Mecklenburg Plateau, 121

Mecksek Hts., 197, 205

Mediterranean Region, 24-42, 49-51, 57-62, 68-70

Mediterranean Sea, 25, 70, 152, 237, 331

Memel (*see* Klaipeda)

Mer de Glace, 186, 190

Meseta, 9, 239-242

Messina, 236

Metohija, 220, 372, 373

Metz, 168

Meuse, Côtes de, 168

Meuse, R., 97, 114, 168

Middle Danubian Lowlands, 197, 203-209

Middle Danubian Uplands, 197, 203

Midia, 368

Milan, 26, 229, 230

Millevaches Plateau, 144

Minho, R., 245, 247

Minorca, 255

Minsk, 94

Miskolc, 205

Mittelland Canal, 104, 122

Modena, 229

Moldavia, 95, 283, 336, 367

Moldavian Carpathians, 197, 201, 304

Molotov, 276

Mons, 114

Mont Blanc, 16, 189

Mont Cenis Pass, 184, 187

Monte Gargano, 232

Montenegro, 93, 371, 372, 373

Monte Somma, 235

Monteserrat, 229

Morava, R. (Czechoslovakia), 171, 205, 206

Morava, R. (Yugoslavia), 212, 213, 218, 220

Moravia, 205, 206, 359, 360

INDEX

- Moravian Corridor, 205, 206
 Moravian Gate, 205, 206
 Moravian Plateau, 171
 Moravska Ostrava, 124
 Morocco, 310
 Morvan, 144, 148
 Moscow (Moskva), 18, 26, 94, 270, 274,
 279-282, 334, 340
 Moselle, Côtes de, 168
 Moselle, R. and V., 158, 168
 Moskva, R. 280
 Mulhouse, 161
 München-Gladbach, 111
 Munich, 26, 166, 178, 180
 Munster, 110
 Mur, R., 184, 196, 203, 382
 Murcia, 255
 Mures, R., 201, 202, 203, 207
 Murmansk, 273
 Mürz, R., 184, 196

 Namur, 114
 Nancy, 168
 Nantes, 138
 Nao, Cap de la, 241
 Naples, 235
 Naretna (Narenta), R., 212, 217
 Narvik, 261
 Neapolitan Basin, 235
 Neckar, R., 165
 Neckar-Main Scarp-lands, 165, 166
 Neisse, R., 95
 Nemunas (Nieman), R., 75, 121, 122
 Netherlands, 86, 96-115, 300-302, 390,
 391, 392
 Netze (*see* Notec)
 Neuchâtel, L., 178
 Neva, R., 279, 280
 New Waterway (Holland), 104
 Nice, 153
 Nijni Novgorod, 281, 282
 Nikolaiev, 287
 Nikopol, 285
 Nîmes, 153
 Nis (Nish), 213
 Nishava, R., 213
 Nord-Ostsee Canal, 103
 Normandy, 133, 135, 136, 137, 308
 Norrköping, 267
 Norrland, 262
 North Bohemian Trough, 171
 North Cape, 36, 262
 North Danubian Plains, 178, 180
 North French Lowland, 126-135
 North Holland Canal, 104
 North Italian Plain, 16, 41, 226-230
 North Sea Canal, 104
 North-western Highlands, 2-7
 Norway (*see also* Scandinavian Peninsula),
 6, 58, 64, 292-294
 Notec, R., 122
 Novaya Zemlya, 26
 Novosibirsk, 338
 Nürnberg (Nuremberg), 166, 167

 Ob, R., 338
 Odenwald, 165
 Oder, R. and V., 95, 121, 122, 124, 354

 Odessa, 26, 287
 Ofanto, R., 234
 Ohre, R. and V., 172
 Ohrid, L., 220
 Oise, R., 130, 131
 Oka, R., 280, 281
 Olt, R., 201, 202
 Onega, L., 274
 Oporto, 26, 247
 Orange, 311
 Orenburg, 26
 Orleans, 135
 Orsk, 276
 Orsova, 202, 203
 Oslo, 259, 264
 Ostend, 98, 105
 Othe, 132
 Otranto, Strait, 212
 Ottoman Empire, 81, 93
 Oviedo, 241, 245
 Oxelösund, 266

 Palatinate Hill-land, 167
 Palermo, 26, 237
 Palma, 255
 Pannonian Basin (*see* Hungarian Basin)
 Papal States, 323
 Paris, 26, 127-131, 134, 313
 Paris Basin, 126
 Parma, 229
 Pechora, R., 271, 275
 Pecs, 205
 Peipus, L., 279
 Peninsular Europe, 2, 21, 75, 87, 89, 291
 Pera, 223
 Perdu, Mt., 247
 Perm (*see* Molotov)
 Perugia, 233
 Petrosani, 202
 Philippopolis (*see* Plovdiv)
 Phlegrean Fields, 235
 Piacenza, 228, 229
 Piava, R., 183
 Picardy, R., 133
 Piedmont Alps, 194
 Pindus, Mts., 215
 Pinsk (*see* Pripyat)
 Pinzgau, 183
 Piræus, 224
 Pisa, 233
 Plauen, 175
 Plöesti, 210
 Plovdiv, 213, 222
 Plzen (Pilsen), 171
 Po, R., 227-229
 Poitou, 135
 Poland, 10, 50, 61, 79, 81, 86, 93-95,
 116-125, 270, 278, 354-359
 "Polish Corridor," 121
 Poljarno, 273
 Pomeranian Plateau, 121
 Pompeii, 235
 Pontine Marshes, 233
 Porkkala, 297
 Portugal (*see also* Iberian Peninsula), 83,
 239-244, 247-248, 320-322
 Posnan, 123
 Praha (Prague), 171, 174
 Pregel, R., 121

INDEX

Prespa, L., 220
 Pressburg (*see* Bratislava)
 Pripyat (Pripet) Marshes, 58, 118, 279, 283
 Provence, 153, 311
 Prussia (*see also* East Prussia), 80
 Prut, R., 211
 Pussta, 199, 208
 Pusteria, Val, 183
 Puy (Le Puy), 143
 Puy de Dôme, 145
 Pyrenees Mts., 14, 239, 241, 242, 246-247,
 253, 306, 315

Quercy, 147, 148

Regensburg, 166
 Reggio, 236
 Reims, 131
 Remscheid, 113
 Rennes, 136
 Reno, R., 228
 Recita, 203
 Reuss, R., 184
 Revel, 278
 Reykjavik, 269
 Rhine-Main-Danube Canal, 156, 166
 Rhine Plateau, 9, 156-158
 Rhine, R. and V., 101, 103, 104, 106, 107,
 108, 111, 114, 157-163, 183, 184, 190, 301
 Rhodes (Rodi), 212
 Rhodope (*see* Rodopi)
 Rhön, 170
 Rhône, R. and V., 150-153, 183, 184, 187,
 190, 191, 310-311
 Rhône-Rhine Canal, 161
 Rhône-Rhine Plateau, 178-179
 Rhône-Saône Trough, 143, 149-151
 Riesen Gebirge, 173
 Riga, 278
 Rijeka (Fiume), 208, 212, 216, 372
 Río Tinto, 250
 Rion, R., 288
 Riviera (France), 62, 153, 194
 Riviera (Italy), 62, 230
 "Riviera" (Russia), 287
 Roanne, 146
 Rodopi Mts., 16, 213, 215, 220, 221
 Romanche, R., 191
 Romania (*see* Rumania)
 Rome, 26, 88, 233, 323, 325
 Romsdal, 261
 Rostov, 286
 Rotterdam, 101, 104, 300, 301, 302, 390
 Roubaix, 112
 Rouen, 133, 134
 Rügen, Is., 121
 Ruhr, 103, 111-114, 384, 385
 Ruhrort, 114
 Rumania, 68, 85, 89, 93, 95, 197-199,
 201-203, 207-211, 283, 363, 366-368
 Russia (*see also* U.S.S.R.), 7, 17-20, 35,
 51-57, 60, 61, 66, 67, 68, 79, 81, 86, 87,
 89, 93-95, 270-289, 336-7
 Russian Platform, 17, 18
 Ruthenia, 201, 359, 360
 Rybinsk, 347

Saale, R., 169, 170
 Saar Basin, 167, 307, 383, 384
 Lake, 275, 297

St. Etienne, 149, 151
 St. Gotthard Pass, 184, 187
 St. Nazaire, 138
 St. Petersburg (*see* Leningrad)
 St. Vincent, Cape, 242
 Sajo R., 200, 205
 Salonika (Thessaloniki), 212, 225, 327
 Salzach, R., 183, 193
 Salzburg, 180, 382
 Santander, 245
 Samara, 283
 Sambre, R., 114
 Sambre-Meuse Coalfield, 303
 San, R., 124
 Santiago, 26, 242
 Saône, R. and V., 131, 149, 150, 151
 Sarajevo, 371, 373
 Saratov, 286
 Sardinia, 237, 238, 331, 333
 Sauerland, 157
 Saumur, 135
 Sava, R., 196, 203, 207, 208, 209, 212, 218
 Saverne, 163
 Saxon Uplands, 11, 170, 175, 176
 Saxony Coalfield, 11, 175
 Scandinavian Highlands, 2-7, 45, 64
 Scandinavian Peninsula, 2-9, 59, 76, 79,
 85, 257-269
 Scandinavian States (*see* Denmark, Nor-
 way and Sweden)
 Scania, 119, 120, 268
 Schelde Plains, 111
 Schelde, R., 97, 99, 105, 112, 303
 Scheveningen, 98
 Schwyz, 377
 Segre, R., 251
 Segura, R., 255
 Seine, R. and V., 127-134
 Semmering Pass, 184
 Senne, R., 112
 Serbia, 93, 327, 371, 372, 373
 Seret, R., 211
 Sète, 152
 Setubal, 248
 Seville, 252
 Shkodra (Scutari), 220
 Sibenik, 217
 Sicily, 236-237, 323
 Sierra de Gata, 240, 249
 Sierra de Gredos, 240, 249
 Sierra de Guadarrama, 240, 249
 Sierra Morena, 241, 250
 Sierra Nevada, 252
 Sil, R., 245
 Sila, Mt., 236
 Silesia, 124, 356
 Silesian Coalfield, 95, 124, 206
 Simplon Pass, 184, 186, 189
 Skagens Horn, 119
 Skopje, 373
 Slana, R. (*see* Sajo R.)
 Slesvig, 298
 Slovakia (*see* Czechoslovakia)
 Slovakian Ore Mts., 199-201
 Slovenia, 372, 373
 Söderköping, 267
 Sofia, 26, 213, 214, 221
 Sogne Fiord, 257
 Solingen, 113
 Sologne, 135

INDEX

- Somport Tunnel, 247
 Spain (*see also* Iberian Peninsula), 14, 50,
 51, 82, 83, 85, 239-255, 315-320
 Spessart, 165
 Spezia, 232
 Spitsbergen (Svalbard), 3, 268, 309
 Split, 216, 217
 Splügen Pass, 184, 185
 Spree, R., 103, 122
 Stalin (Varna), 370
 Stalingrad, 286, 287, 345
 Stalino, 286
 Stara Planina (*see* Balkan Mts.)
 Stassfurt, 123, 124, 169
 Stavanger, 257, 259
 Steppe-lands, 39, 40, 48, 49, 54, 344, 345
 Steppe-lands Region, 67-68
 Stettin (*see* Szczecin)
 Stockholm, 26, 266, 267, 295
 Strasbourg, 161
 Stromboli, Mt., 237
 Struma, R., 221, 223
 Stuttgart, 166
 Sub-boreal Forest Region, 66-67
 Subotica, 209
 "Sudeten Lands," 171, 319
 Sidetes Uplands, 170-173
 Suomi, 274
 Susak, 212, 216
 Svalbard (*see* Spitsbergen)
 Sverdlovsk, 276
 Swabian Alb, 165, 166
 Sweden (*see also* Scandinavian Peninsula),
 8, 65, 66, 119, 120, 292, 294-296
 Switzerland, 83, 85, 86, 91, 160, 161, 176-
 179, 182-196, 377-380
 Szczecin (Stettin), 116, 121, 358
 Tadzhik Republic, 336
 Taganrog, 286
 Tagliamento, R., 226
 Tagus, R. and V., 239, 240, 242, 247, 248
 Tagus-Guadiana Plateau, 240, 241, 249,
 250
 "Taiga" Region, 45, 275
 Tallinn, 278, 297
 Tampere (Tammerfors), 275
 Taranto, 235
 Tarn, 147
 Tatra Mts., 16, 199-201
 Taunus, 157
 Tbilisi (Tiflis), 288
 Tellina, Val, 183
 Temperate Europe Region, 70-74
 Terek, R., 287
 Terneuzen, 105
 Tesin (Teschen), 124
 Teutoberger Wald, 170
 Thessaloniki (*see* Salonika)
 Thessaly, 223
 Thuringian Basin, 169
 Thuringian Forest, 169
 Tiber, R., 233, 234, 325
 Ticino, R., 184
 Tiflis (*see* Tbilisi)
 Timan Uplands, 10
 Tirana, 219
 Tirol, 324
 Tisza (Tisa), R., 200, 201, 202, 205, 207,
 208
 Titograd, 373
 Toce, R., 184, 186, 187
 Toledo, 250
 Toulouse, 141
 Torun (Thorn), 122
 Toulon, 154
 Tournai, 112
 Tours, 135
 Transcaucasia, 87, 94, 288, 289, 291, 336
 Transylvania, 86, 87, 93, 367
 Transylvanian Alps, 16, 197, 202-203
 Transylvanian Basin, 197, 201, 202, 367
 Transylvanian (West) Highlands, 197, 203
 Trave, R., 103
 Trentino, 324
 Trieste (Trst), 212, 216, 324, 325, 372
 Trollhätta Falls, 267
 Tromsø, 261
 Trondheim, 257, 259
 Trunk Europe, 2, 24, 75, 87, 88, 89, 291
 Tsimlyansk, 345
 Tula, 282
 Tundra, 44, 54, 64
 Tunguska, R., 338
 Tunisia, 310
 Tunja, R., 213, 222
 Turin, 195, 228, 229
 Turkey, 88, 93, 213-216, 222-223, 327-328
 Turkistan, 336, 339, 344
 Turkmen Republic, 336, 345
 Turku, 278
 Tuscan-Roman Hill-lands, 232-234
 Tyrrhenian Sea, 237
 Ufa, 283
 Ukraine, 87, 95, 270, 272, 279, 282-287,
 298, 336, 345, 360
 Union of Soviet Socialist Republics (*see*
also Russia), 93-95, 270-288, 289, 290-
 293, 296-297, 335-352, 353-376
 Unterwalden, 377
 Upper Silesia (*see* Silesia)
 Ural Mts., 10, 18, 275-277, 338
 Ural, R., 276, 277, 287
 Uri, 377
 Usbec Republic, 336
 Uskudar (Scutari), 223
 Vah, R., 199
 Valdai Hills, 18, 280
 Valencia, 26, 250, 254
 Valencian Lowland, 253, 254
 Valenciennes, 115
 Valentia Is., 26
 Valladolid, 248, 249
 Valois, 130
 Väner, L., 8, 264, 266, 267
 Vardar, R., 212, 223, 372
 Varna (Stalin), 222, 370
 Vätter, L., 8, 264, 266, 267, 268
 Veluwe, 106
 Venice, 229-230
 Verdun, 168
 Verona, 229
 Verviers, 114
 Vesuvius, Mt., 235
 Vienna, 206, 381, 382
 Vienna Basin, 206

INDEX

- Vigo, 245
- Viiipuri (Viborg), 278
- Vilnius (Vilna), 122, 279
- Vistula (Wisla), R. and V., 121, 122, 123, 124, 125
- Vltava, R., 171
- Vogelsberg, 170
- Vojvodina, 372, 373, 375
- Volga, R., 20, 274, 275, 280-283, 286-289, 345, 347
- Vorder Rhine, R., 187
- Voronezh, 286
- Voroshilovgrad, 286
- Vosges, Mts., 9, 164, 165, 167
- Vulcano, Mt., 237

- Waal, R., 104, 106, 109
- Wadden (Watten), 99
- Walachia, 202, 367
- Walachian Hill-lands, 197, 199, 209, 210
- Walachian Plains, 16, 197, 199, 209, 210
- Warszawa (Warsaw), 26, 27, 123, 354
- Warta (Warte), R., 122
- Weser, R., 101, 103, 107
- Weser Hills, 170
- Weser-Saale Hill Country, 169, 170
- West Danubian Plateau, 207, 208
- Westerwald, 158
- Westphalian Embayment, 110
- West Rhine Scarplands, 164, 165, 167-169

- West Transylvanian Hlds., 197, 203
- White Russia, 87, 95, 272, 279, 297, 298, 336
- Wieliczka, 125
- Wieringermeer, 301
- Wisla (*see* Vistula)
- Woëvre, 168
- Wroclaw (Breslau), 124
- Wuppertal, 111, 113

- Yaila Mts., 14, 287
- Yakutsk, 338
- Yonne, R., 131
- Yugoslavia, 86, 88, 89, 93, 182, 207-209, 212-221, 325, 327, 363, 370-375, 376

- Zagreb, 208, 373
- Zamora, 240
- Zaporozhe, 285
- Zara (Zadar), 216
- Zaragoza, 247, 251
- Zealand, 120
- Zeebrugge, 105
- Zhdanov, 286
- Zlatna, 203
- Zlatousk, 276
- Zuider Zee, 98, 99, 106, 301
- Zürich, 179, 380
- Zwickau, 175